



LONDON-WEST MIDLANDS ENVIRONMENTAL STATEMENT

Volume 5 | Map books

Sound, noise and vibration - Euston and London Metropolitan (*Part 1 of 4*)

November 2013

ES 3.5.1.9.1



Department for Transport

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Map series description	<p><i>SV-01 presents the predicted operational sound from the new railway.</i></p> <p><i>The sound levels from the new railway (expressed as LpAeq,T) are presented in typical noise mapping colours in 5 dB steps. There is a panel at the top right of the figure; the left-hand section of this panel contains a key communicating the night-time and daytime sound levels represented by the various colours. The right-hand part of the same panel contains text explaining how the sound levels presented on the figure inform the assessment of direct noise impacts and likely significant effects. A corresponding and similar panel is found on SV-02, along with the key sound contours that were used within the environmental assessment.</i></p>	<p><i>SV-02 presents the direct operational noise impacts and likely significant effects of the Proposed Scheme.</i></p> <p><i>The SV-02 figure series necessarily contains a large amount of information relating to the operational noise and vibration assessment. It is designed to communicate visually the assessment process from the prediction of impacts to the determination of likely residual significant effects. The corresponding text is included in Volume 2 and Volume 5.</i></p>	<p><i>The SV-03 figure series accompanies the construction noise & vibration assessments. It shows the locations at which a quantitative assessment of the direct effects of construction noise and/or vibration has been carried out. These are labelled as assessment locations with a reference number to enable cross-reference to the construction noise and vibration reports contained in Volume 5: Appendix SV-003 and Volume 5: Appendix SV-002.</i></p> <p><i>The figure series also shows locations at which baseline sound measurements were carried out. These baseline measurement locations are labelled with a reference number to enable cross-reference to the baseline sound reports contained in Volume 5: Appendix SV-002.</i></p>	<p><i>The SV-04 figure series shows the locations at which a quantitative assessment of the direct effects of operational sound and/or vibration has been carried out. These are labelled as assessment locations with a reference number to enable cross-reference to the operational sound and vibration reports contained in Volume 5: Appendix SV-004 and Volume 5: Appendix SV-002.</i></p> <p><i>The figure series also shows locations at which baseline sound measurements were carried out. These baseline measurement locations are labelled with a reference number to enable cross-reference to the baseline sound reports contained in Volume 5: Appendix SV-002.</i></p>
Community Forum Area name				
CFA 01 – Euston – Station and Approach	✓	✓	✓	✓
CFA 02 – Camden Town and HS1 Link	✓	✓	✓	✓
CFA 03 – Primrose Hill to Kilburn (Camden)	✗	✓	✓	✓
CFA 04 – Kilburn (Brent) to Old Oak Common	✓	✓	✓	✓
CFA 05 – Northolt Corridor	✗	✓	✓	✓
CFA 06 – South Ruislip to Ickenham	✓	✓	✓	✓

Mapping explanatory notes

Copyright statements

Copyright statements are presented in the data dictionary and definitions section at the front of the map book, due to limited space to include this on the individual maps themselves.

Ordnance Survey data

All maps produced as part of the London-West Midlands Environmental Statement (ES) contain Ordnance Survey (OS) data. HS2 Ltd uses the most up-to-date mapping available, where possible, supplied by the OS. As such, we cannot be held responsible for any inaccuracies within this data.

As part of our licence conditions, all digital maps carry a watermark.

Chainage

Most of the maps presented as part of the ES have a chainage value shown next to the alignment. Chainage is presented on the maps in black font, in the form of XX+YYY, for example: 77+000.

Chainage (known as reference chainage) is referenced from Euston station, which is 0+000, and the value presented is in metres. For example, 77+000 refers to the point 77,000m, or 77km, from Euston station. Chainage values increase in intervals dependant on the map scale. For maps at 1:50,000, scale chainage is shown at 5km intervals. For maps at 1:25,000, scale chainage is shown at 2km intervals. For maps at 1:10,000, 1:5,000 and 1:2,500 scales, chainage is shown at 1km intervals.

Chainage has been included on the maps as a useful tool for comparing map sets showing the different environmental themes or engineering plans, due to map sets having different scales and therefore showing differing amounts of alignment on the map.

Map orientation

The majority of the maps presented in these map books are presented with the railway alignment running horizontally across the page. The direction of travel to London would be following the alignment to the right hand side of the page, and the West Midlands to the left.

The exceptions to this are map series LV-02, LV-03, LV-04, LV-07 and LV-08, which present the alignment running from the bottom to the top of the page. This is to allow more of the modelled outputs to be shown at the appropriate map scale. In this instance, the direction of travel to London would be to the bottom of the page, and the West Midlands to the top.

Map books

There are a total of 76 map books in the ES, spread across Volumes 2, 4 and 5. A list of the titles is provided in the table below for reference.

Name	Name
Volume 2 Map Books Community Forum Area: 01 Euston – Station and Approach	Volume 5 Map Books: Ecology – Community Forum Area: 05 Northolt Corridor
Volume 2 Map Books Community Forum Area: 02 Camden Town and HS1 Link	Volume 5 Map Books: Ecology – Community Forum Area: 06 South Ruislip to Ickenham
Volume 2 Map Books Community Forum Area: 03 Primrose Hill to Kilburn (Camden)	Volume 5 Map Books: Ecology – Community Forum Area: 07 Colne Valley
Volume 2 Map Books Community Forum Area: 04 Kilburn (Brent) to Old Oak Common	Volume 5 Map Books: Ecology – Community Forum Area: 08 The Chalfonts and Amersham
Volume 2 Map Books Community Forum Area: 05 Northolt Corridor	Volume 5 Map Books: Ecology – Community Forum Area: 09 Central Chilterns
Volume 2 Map Books Community Forum Area: 06 South Ruislip to Ickenham	Volume 5 Map Books: Ecology – Community Forum Area: 10 Dunsmore, Wendover and Halton
Volume 2 Map Books Community Forum Area: 07 Colne Valley	Volume 5 Map Books: Ecology – Community Forum Area: 11 Stoke Mandeville and Aylesbury
Volume 2 Map Books Community Forum Area: 08 The Chalfonts and Amersham	Volume 5 Map Books: Ecology – Community Forum Area: 12 Waddesdon and Quainton
Volume 2 Map Books Community Forum Area: 09 Central Chilterns	Volume 5 Map Books: Ecology – Community Forum Area: 13 Calvert, Steeple Claydon, Twyford and Chetwode
Volume 2 Map Books Community Forum Area: 10 Dunsmore, Wendover and Halton	Volume 5 Map Books: Ecology – Community Forum Area: 14 Newton Purcell to Brackley
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Volume 2 Map Books Community Forum Area: 12 Waddesdon and Quainton	Volume 5 Map Books: Ecology – Community Forum Area: 16 Ladbroke and Southam
Volume 2 Map Books Community Forum Area: 13 Calvert, Steeple Claydon, Twyford and Chetwode	Volume 5 Map Books: Ecology – Community Forum Area: 17 Offchurch and Cublington
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Volume 2 Map Books Community Forum Area: 17 Offchurch and Cublington	Volume 5 Map Books: Ecology – Community Forum Area: 21 Drayton Bassett, Hints and Weeford
Volume 2 Map Books Community Forum Area: 18 Stoneleigh, Kenilworth and Burton Green	Volume 5 Map Books: Ecology – Community Forum Area: 22 Whittington to Handsacre
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Volume 2 Map Books Community Forum Area: 23 Balsall Common and Hampton-in-Arden	Volume 5 Map Books: Land Quality
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Volume 2 Map Books Community Forum Area: 25 Castle Bromwich and Bromford	Volume 5 Map Books: Landscape and Visual – Country South
Volume 2 Map Books Community Forum Area: 26 Washwood Heath to Curzon Street	Volume 5 Map Books: Landscape and Visual – Country North
Volume 4 Map Books Off Route Effects	Volume 5 Map Books: Landscape and Visual – West Midlands Metropolitan
Volume 5 Map Books: Agriculture, Forestry and Soils	Volume 5 Map Books: Socio-Economic
Volume 5 Map Books: Air Quality	Volume 5 Map Books: Sound, Noise and Vibration – Euston and London Metropolitan
Volume 5 Map Books: Community	Volume 5 Map Books: Sound, Noise and Vibration – Country South
Volume 5 Map Books: Cultural Heritage – Euston and London Metropolitan	Volume 5 Map Books: Sound, Noise and Vibration – Country North
Volume 5 Map Books: Cultural Heritage – Country South	Volume 5 Map Books: Sound, Noise and Vibration – West Midlands Metropolitan
Volume 5 Map Books: Cultural Heritage – Country North	Volume 5 Map Books: Traffic and Transport
Volume 5 Map Books: Cultural Heritage – West Midlands Metropolitan	Volume 5 Map Books: Water Resources – Euston and London Metropolitan
Volume 5 Map Books: Ecology – Community Forum Area: 01 Euston - Station and Approach	Volume 5 Map Books: Water Resources – Country South
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Volume 5 Map Books: Ecology – Community Forum Area: 04 Kilburn (Brent) to Old Oak Common	Volume 5 Map Books: Cross Topic Appendix 1: Committed Developments



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LONDON-WEST MIDLANDS ENVIRONMENTAL STATEMENT

Data dictionary and definitions

Data dictionary and definitions

Legend features	Definition	Source	Copyright
Airborne sound and vibration assessment location	Locations near surface sections of the route at which a quantitative assessment of airborne sound and ground-borne vibration impacts due to the operation of the Proposed Scheme has been carried out. These are labelled with an assessment location reference code to enable cross-reference to the operational sound and vibration reports contained in Volume 5: Appendix SV-004.	High Speed Two (HS2) Ltd	
Airborne sound assessment location	Locations at which a quantitative assessment of airborne sound impacts due to the operation of the Proposed Scheme has been carried out. These are labelled with an assessment location reference code to enable cross-reference to the operational sound and vibration reports contained in Volume 5: Appendix SV-004.	High Speed Two (HS2) Ltd	
Airborne sound, ground-borne sound and vibration assessment location	Locations at which a quantitative assessment of airborne sound, ground-borne sound and vibration impacts due to the operation of the Proposed Scheme has been carried out. These are labelled with an assessment location reference code to enable cross-reference to the operational sound & vibration reports contained in Volume 5: Appendix SV-004.	High Speed Two (HS2) Ltd	
Airborne sound study area	This defines the area within which operational airborne sound impacts of the scheme have been quantitatively assessed. This area is defined as within 1km of surface sections of the route in rural areas and within 500m of surface sections of the route in urban areas.	High Speed Two (HS2) Ltd	
Baseline measurement locations	These represent locations at which sound measurements were carried out as part of the baseline sound surveys. Measurements of existing baseline sound levels at these locations have been used to derive baseline sound levels at operational and construction sound assessment locations. These baseline measurement locations are labelled with a reference number which enables cross-reference to the baseline sound reports contained in Volume 5: Appendix SV-002, which also describes how these are linked to baseline levels at assessment locations.	High Speed Two (HS2) Ltd	
Committed developments	This informs the assessment of the future baseline. A development consent or allocation that has full or outline planning permission, or is allocated in an adopted development plan.	High Speed Two (HS2) Ltd	© Crown Copyright and database rights 2013 Ordnance Survey Licence Number 100049190.
Community Forum boundary	The Environmental Statement has been split into 26 sections called Community Forum Areas.	High Speed Two (HS2) Ltd	© Crown Copyright and database rights 2013 Ordnance Survey Licence Number 100049190.
Construction airborne sound and vibration assessment location	Locations at which a quantitative assessment of construction noise and vibration impacts of the Proposed Scheme has been carried out. These are labelled with an assessment location reference code to enable cross-reference to the construction sound & vibration reports contained in Volume 5: Appendix SV-003.	High Speed Two (HS2) Ltd	
Construction airborne sound assessment location	Locations at which a quantitative assessment of construction noise impacts of the Proposed Scheme has been carried out. These are labelled with an assessment location reference code to enable cross-reference to the construction sound & vibration reports contained in Volume 5: Appendix SV-003.	High Speed Two (HS2) Ltd	

Legend features	Definition	Source	Copyright
Construction vibration assessment locations	Locations at which a quantitative assessment of construction vibration impacts of the Proposed Scheme has been carried out. These are labelled with an assessment location reference code to enable cross-reference to the construction sound & vibration reports contained in Volume 5: Appendix SV-003.	High Speed Two (HS2) Ltd	
County boundary	County boundaries from Ordnance Survey boundary mapping.	Ordnance Survey	© Crown Copyright and database rights 2013 Ordnance Survey Licence Number 100049190.
Depot, station, headhouse or portal building	Extends to cover operational footprint of each depot and station and the footprint of each tunnel vent shaft and headhouse at surface level. Excludes any ancillary buildings associated with these structures.	High Speed Two (HS2) Ltd	
District/Borough boundary	Ordnance Survey local authority boundary mapping.	Ordnance Survey	© Crown Copyright and database rights 2013 Ordnance Survey Licence Number 100049190.
Engineering earthworks: cutting	Cuttings created in the construction of the railway and associated works such as highways.	High Speed Two (HS2) Ltd	
Engineering earthworks: embankment	Embankments created in the construction of the railway and associated works such as highways.	High Speed Two (HS2) Ltd	
Envisaged measures further reducing noise effects	Other environmental features e.g. landscaping: These lines represent environmental mitigation features provided for reasons other than noise mitigation which also reduce sound levels from the Proposed Scheme to the surrounding environment. These features are not placed specifically to reduce or remove a likely significant noise effect. Examples include landscaping and visual mitigation earthworks (non-engineering earthworks). Engineering e.g. cuttings: These lines represent engineering features which reduce sound levels from the Proposed Scheme to the surrounding environment but are not placed specifically to reduce or remove a likely significant noise effect. Examples include cuttings and safety barriers on viaducts which are not close to sensitive receptors.	High Speed Two (HS2) Ltd	
Envisaged mitigation to avoid/reduce significant noise effects	Landscaping and/or fence barriers: These lines represent the envisaged mitigation provided specifically to reduce sound levels from the Proposed Scheme at sensitive receptors in order to reduce or remove likely operational significant noise effects. Examples include noise fence barriers or earth bunds (non-engineering earthworks) acting as noise barriers. These features are labelled with the height of the top of the barrier/bund above rail level. Engineering e.g. cuttings (green tunnels separately marked): These lines represent engineering features of the route which reduce sound levels from the Proposed Scheme at potentially significant sensitive receptors. These features, therefore, serve a material purpose in reducing or avoiding likely significant noise effects. Examples include engineering cuttings near to sensitive receptors. These features are labelled with the height of the top of the feature above rail level.	High Speed Two (HS2) Ltd	
Ground-borne sound & vibration study area (highly sensitive non-residential)	This defines the area within which direct operational ground-borne sound and vibration impacts of the scheme at highly sensitive non-residential receptors have been quantitatively assessed. This area is defined as within zoom of the route.	High Speed Two (HS2) Ltd	
Ground-borne sound & vibration study area (residential and non-residential)	This defines the area within which direct operational ground-borne sound and vibration impacts of the scheme at residential and non-residential receptors have been quantitatively assessed. This area is defined as within 85m of the route.	High Speed Two (HS2) Ltd	

Legend features	Definition	Source	Copyright
Ground-borne sound and/or vibration assessment location	Locations near tunnelled sections of the route at which a quantitative assessment of ground-borne sound and vibration impacts due to the operation of the Proposed Scheme has been carried out. These are labelled with an assessment location reference code to enable cross-reference to the operational sound & vibration reports contained in Volume 5: Appendix SV-004.	High Speed Two (HS2) Ltd	
Minor ground-borne noise or vibration impact	Buildings at which a minor operational ground-borne sound or vibration impact is predicted from the Proposed Scheme.	High Speed Two (HS2) Ltd	
Non-engineering earthworks: cutting	Cuttings created in the construction of landscape features and mitigation measures.	High Speed Two (HS2) Ltd	
Non-engineering earthworks: embankment	Embankments created in the construction of landscape features and mitigation measures.	High Speed Two (HS2) Ltd	
Operational airborne sound impacts at buildings	The buildings shown on SV-02 and SV-05 are colour-coded according to the magnitude of the predicted noise impacts of the Proposed Scheme. Noise impacts are calculated by comparing the sound levels predicted if the Proposed Scheme did not go ahead with those if it did (details of this process can be found in Volume 5: Appendix SV001-000). Panel B on SV-02/SV-05 contains a key showing the colours used with the corresponding impact categories. The impacts presented are the greatest (i.e. worst-case) of the impacts predicted for daytime and night-time.	High Speed Two (HS2) Ltd	
Potential additional noise insulation (triggered by maximum sound levels at night)	This represents dwellings which would potentially be provided with noise insulation due to maximum sound levels from the Proposed Scheme (further information regarding assessment criteria can be found in Volume 5 Appendix SV-001).	High Speed Two (HS2) Ltd	
Potential additional noise insulation (triggered by WHO Night Noise Guidelines Interim Target)	This represents dwellings which would potentially be provided with noise insulation due to noise from the Proposed Scheme exceeding the World Health Organization (WHO) night noise guidelines interim target (further information regarding assessment criteria can be found in Volume 5 Appendix SV-001).	High Speed Two (HS2) Ltd	
Potential noise insulation (triggered by Noise Insulation Regulations 1996)	This represents dwellings which would potentially qualify for noise insulation under the Noise Insulation (Railways and Other Guided Transport Systems) Regulations 1996 (further information regarding assessment criteria can be found in Volume 5 Appendix SV-001).	High Speed Two (HS2) Ltd	
Route in tunnel Route on surface	Represents the proposed route of HS2, split into route on surface and tunnelled sections.	High Speed Two (HS2) Ltd	
Sound contours (SV-01)	The sound levels from the Proposed Scheme (expressed as $L_{pAeq,T}$ and representing sound from the new railway only) are presented in 5dB steps. The levels are shown in the panel in the top-right hand corner of SV-01.	High Speed Two (HS2) Ltd	
Sound contours (SV-02/SV-05)	The sound levels from the Proposed Scheme (expressed as $L_{pAeq,T}$ and representing sound from the new railway only) are presented at two sound levels: 40 dB $L_{Aeq,T\ 23:00\ to\ 07:00}$ and 55 dB $L_{Aeq,T\ 23:00\ to\ 07:00}$. The corresponding daytime levels ($L_{Aeq,T\ 07:00\ to\ 23:00}$) are shown in Panel A of SV-02/SV-05.	High Speed Two (HS2) Ltd	



LONDON-WEST MIDLANDS ENVIRONMENTAL STATEMENT

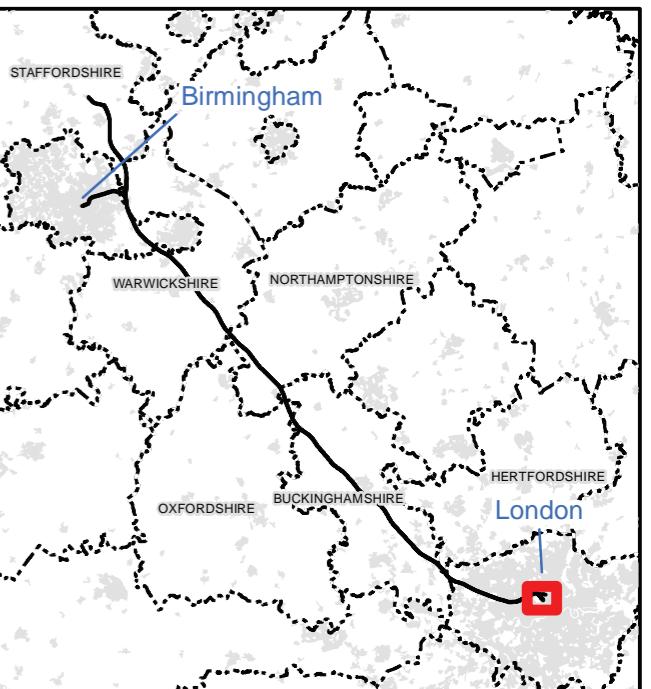
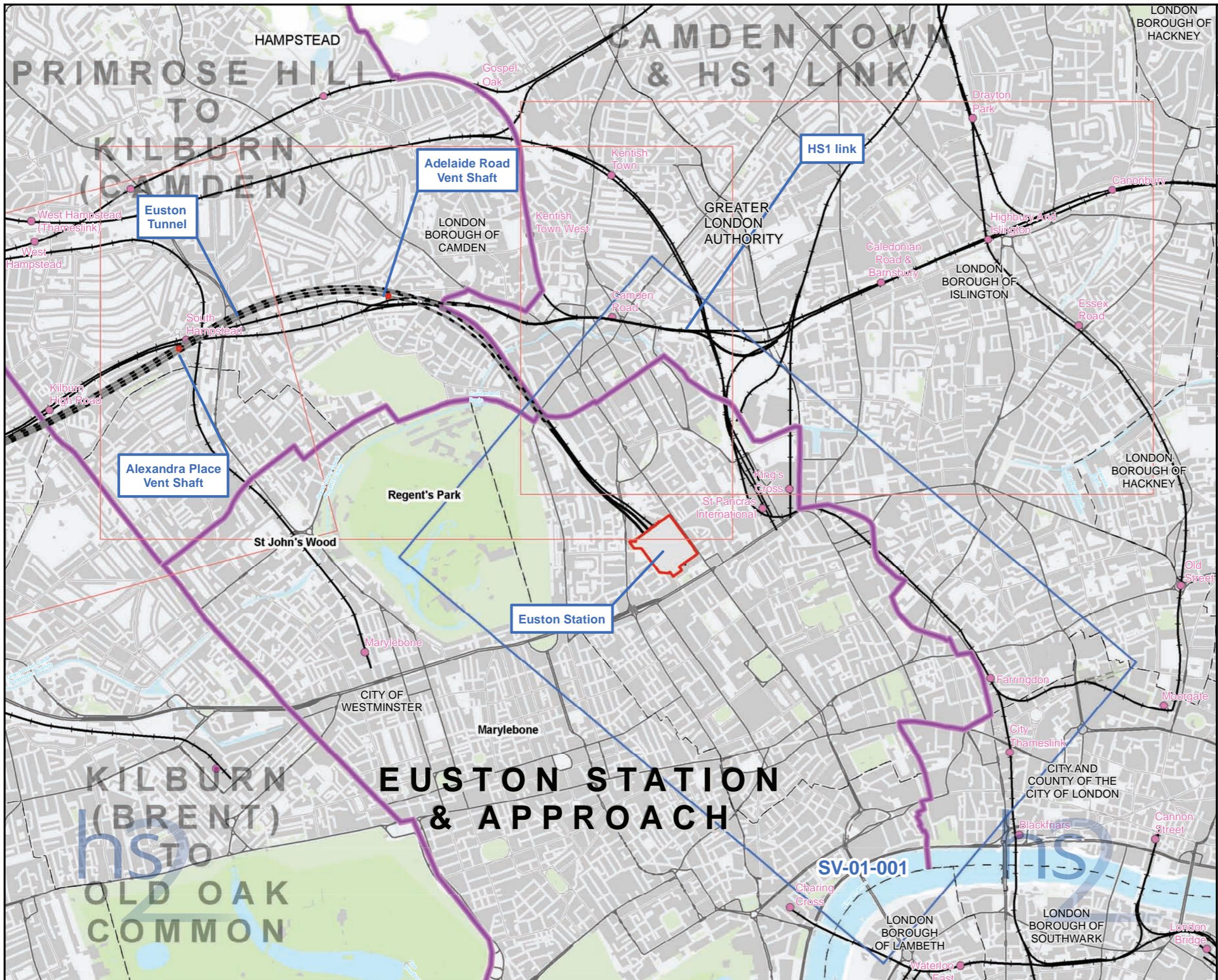
CFA1 | Euston - Station and Approach

SV-01 - Operational Sound Contour Maps and Likely Significant Effects

SV-02 - Operational Airborne Noise and Vibration Impacts and Likely Significant Effects
(with Assessment Locations)

SV-03 - Assessment and Monitoring Locations for Construction Sound, Noise & Vibration Assessments

SV-04 - Assessment and Monitoring Locations for Operational Sound, Noise & Vibration Assessments



Map Series Information:

SV-01 presents the predicted operational sound from the new railway.

The sound levels from the new railway (expressed as $L_{PAeq,T}$) are presented in typical noise mapping colours in 5 dB steps. There is a panel at the top right of the figure; the left-hand section of this panel contains a key communicating the night-time and daytime sound levels represented by the various colours. The right-hand part of the same panel contains text explaining how the sound levels presented on the figure inform the assessment of direct noise impacts and likely significant effects. A corresponding and similar panel is found on SV-02, along with the key sound contours that were used within the environmental assessment.

Also presented on SV-01 are the following (which are also included on SV-02):

- A representation of the Proposed Scheme, including the railway alignment (indicating whether it is on the surface or in tunnel), any new and altered roads and all associated engineering and environmental mitigation earthworks;
- blue and green lines representing the wayside airborne noise mitigation measures included in the Proposed Scheme;
- symbols representing buildings that would potentially qualify for noise insulation;
- labels identifying the residual likely significant noise effects of the Proposed Scheme, and
- the extent of the study area within which the direct impacts and effects of the scheme have been quantitatively assessed.

A more detailed explanation of each legend item included on the figures can be found in the data dictionary.

Note: Not all data layers in the legend are represented on every map.

Map Number: SV-01-INDEX-CFA1

Map Name: Index Map of:
Operational Sound Contour Maps and
Likely Significant Effects

Community Forum Area CFA1:
Euston



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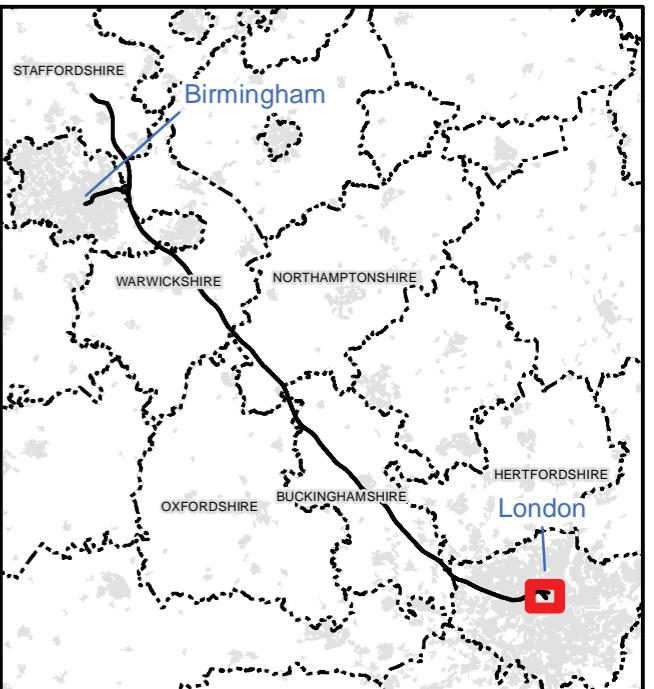
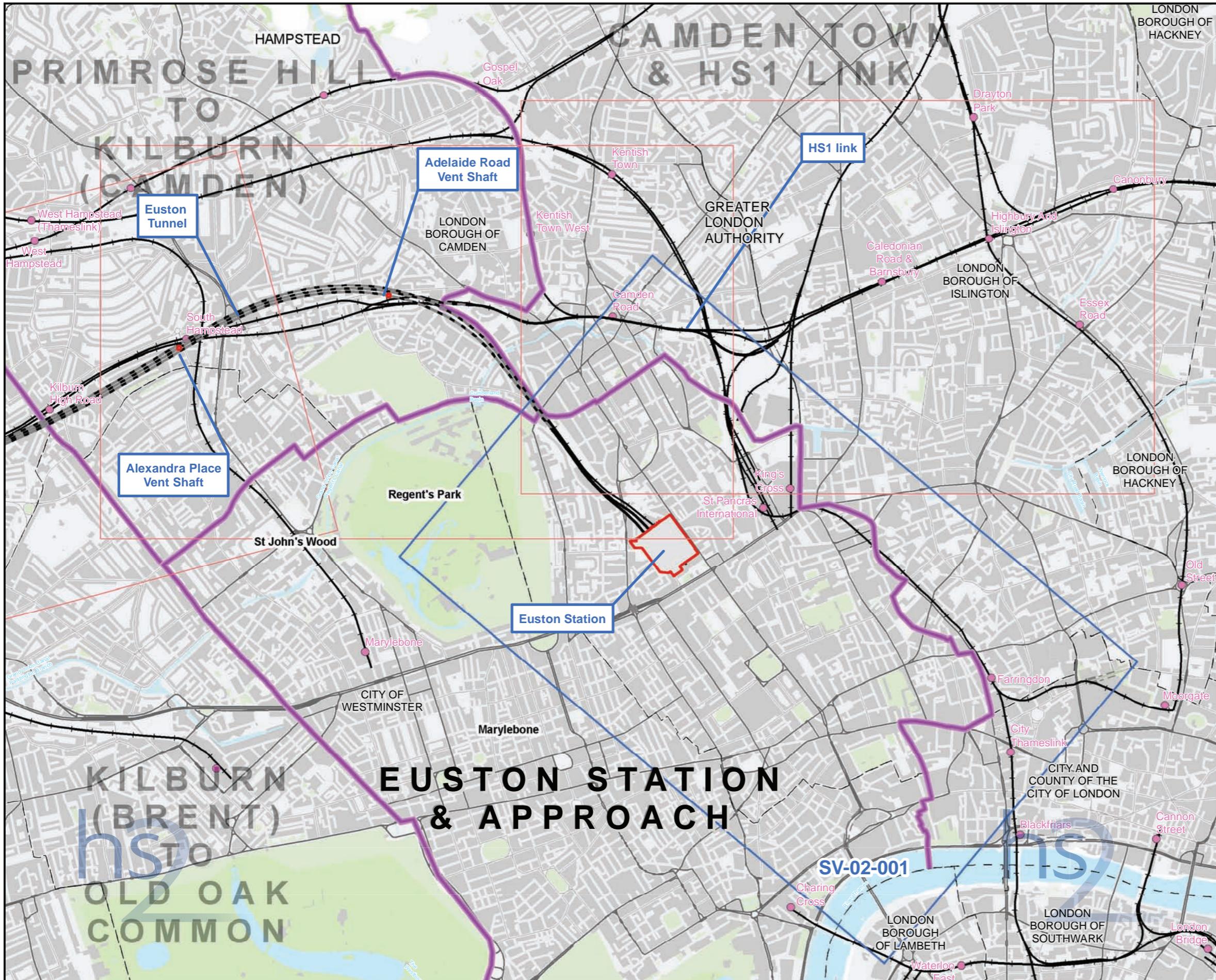
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Metres

Date: 29/10/13

Doc Number: C250-ARP-EV-MAP-000-004058-P04.00



Map Series Information:

SV-02 presents the direct operational noise impacts and likely significant effects of the Proposed Scheme.

The SV-02 figure series necessarily contains a large amount of information relating to the operational noise and vibration assessment. It is designed to communicate visually the assessment process from the prediction of impacts to the determination of likely residual significant effects. The corresponding text is included in Vol2 and Vol5.

Key items on the map include the following:

- The Proposed Scheme (the proposed railway alignments and surrounding associated earthworks/roads);
- blue and green lines representing the wayside airborne noise mitigation measures included in the Proposed Scheme;
- the study areas, which indicate the areas within which direct sound and vibration impacts of the scheme have been quantitatively assessed;
- the calculated direct operational impacts of the scheme, displayed as colour-coded buildings and symbols representing buildings that would potentially qualify for noise insulation;
- sound contours representing sound produced by the new railway (displayed in a simpler manner than on SV-01 in order not to obscure other features on the map series);
- the assessment locations at which a quantitative prediction of sound and impacts have been carried out (representing a number of nearby buildings). These are labelled with a unique reference number to enable cross-reference to further detail regarding the assessments in Volume 5: Appendix SV-004; and
- labels indicating where the likely residual direct noise or vibration significant effects have been identified. These are labelled with a unique reference number to enable cross-reference to further detail regarding the assessments in Volume 5: Appendix SV-004.

A more detailed explanation of each legend item included on the figures can be found in the data dictionary.

Note: Not all data layers in the legend are represented on every map.

Map Number: SV-02-INDEX-CFA1

Map Name: Index Map of:
Operational Noise and Vibration Impacts and Likely
Significant Effects (with Assessment Locations)

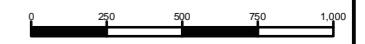
Community Forum Area CFA1:
Euston



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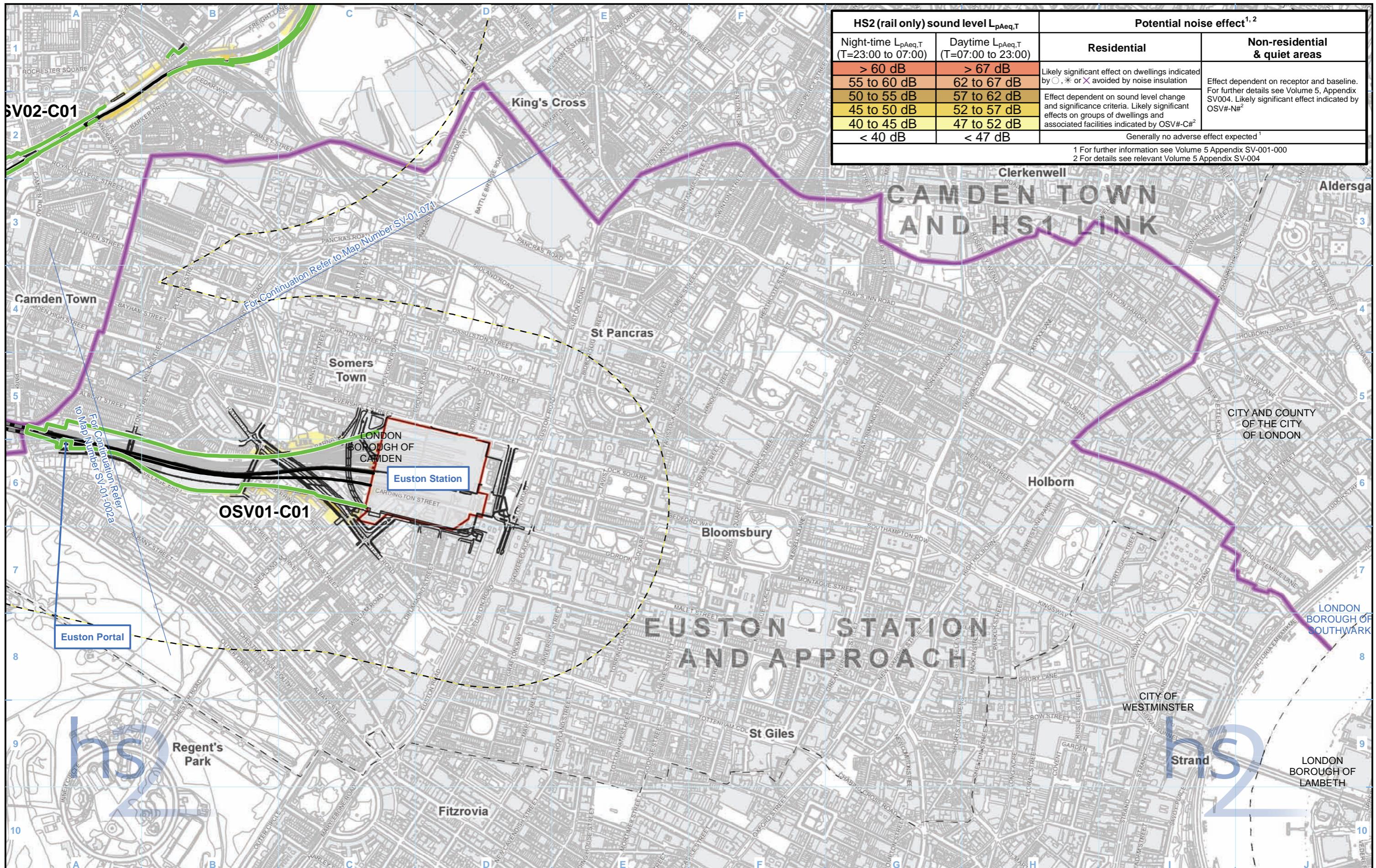


Scale at A3: 1:25,000



Doc Number: C250-ARP-EV-MAP-000-004083--P04.00

Date: 29/10/13



HS2 (rail only) sound level $L_{pAeq,T}$		Potential noise effect ^{1,2}	
Night-time $L_{pAeq,T}$ (T=23:00 to 07:00)	Daytime $L_{pAeq,T}$ (T=07:00 to 23:00)	Residential	Non-residential & quiet areas
> 60 dB	> 67 dB	Likely significant effect on dwellings indicated by , or avoided by noise insulation	Effect dependent on receptor and baseline. For further details see Volume 5, Appendix SV004. Likely significant effect indicated by OSV#-N# ²
55 to 60 dB	62 to 67 dB		
50 to 55 dB	57 to 62 dB		
45 to 50 dB	52 to 57 dB		
40 to 45 dB	47 to 52 dB		
< 40 dB	< 47 dB	Generally no adverse effect expected ¹	

1 For further information see Volume 5 Appendix SV-001-000
2 For details see relevant Volume 5 Appendix SV-004

For further information see Volume 5 Appendix SV-001-000
2 For details see relevant Volume 5 Appendix SV-004

EUSTON - STATION AND APPROACH

Legend - General features

- Route in bored tunnel
 - Route in green tunnel
 - Route on surface
 - Depot, station, headhouse or portal building
 - Community forum boundary
 - District/Borough boundary
 - County boundary

Engineering earthworks:

- The diagram illustrates two types of terrain features. On the left, under the heading 'Embankment', there are two symbols: a vertical line with horizontal dashes at the top and bottom, and a vertical line with a horizontal bar across its middle. On the right, under the heading 'Cutting', there are two symbols: a vertical line with a horizontal bar across its middle, and a vertical line with horizontal dashes at the top and bottom.

Legend - Sound related features

- s: Envisaged mitigation to avoid / reduce significant noise effects:
 - Landscaping and/or fence barriers*
 - Engineering e.g. cuttings (green tunnels separately marked)
 - Envisaged measures further reducing noise effects:
 - ■ ■ Other environmental e.g. landscaping
 - ■ ■ Engineering e.g. cuttings

-  Airborne sound study area
 -  Potential additional noise insulation (triggered by maximum sound levels at night)¹
 -  Potential additional noise insulation (triggered by WHO Night Noise Guidelines Interim Target)¹
 -  Potential noise insulation (triggered by Noise Insulation Regulations 1996)¹

* Labelled with total barrier height above rail level

Map Number

SV-01-001

1

Map Name Operational Sound Contour Maps and Likely Significant Effects

Community Forum Area CFA0
Euston - Station and Approach

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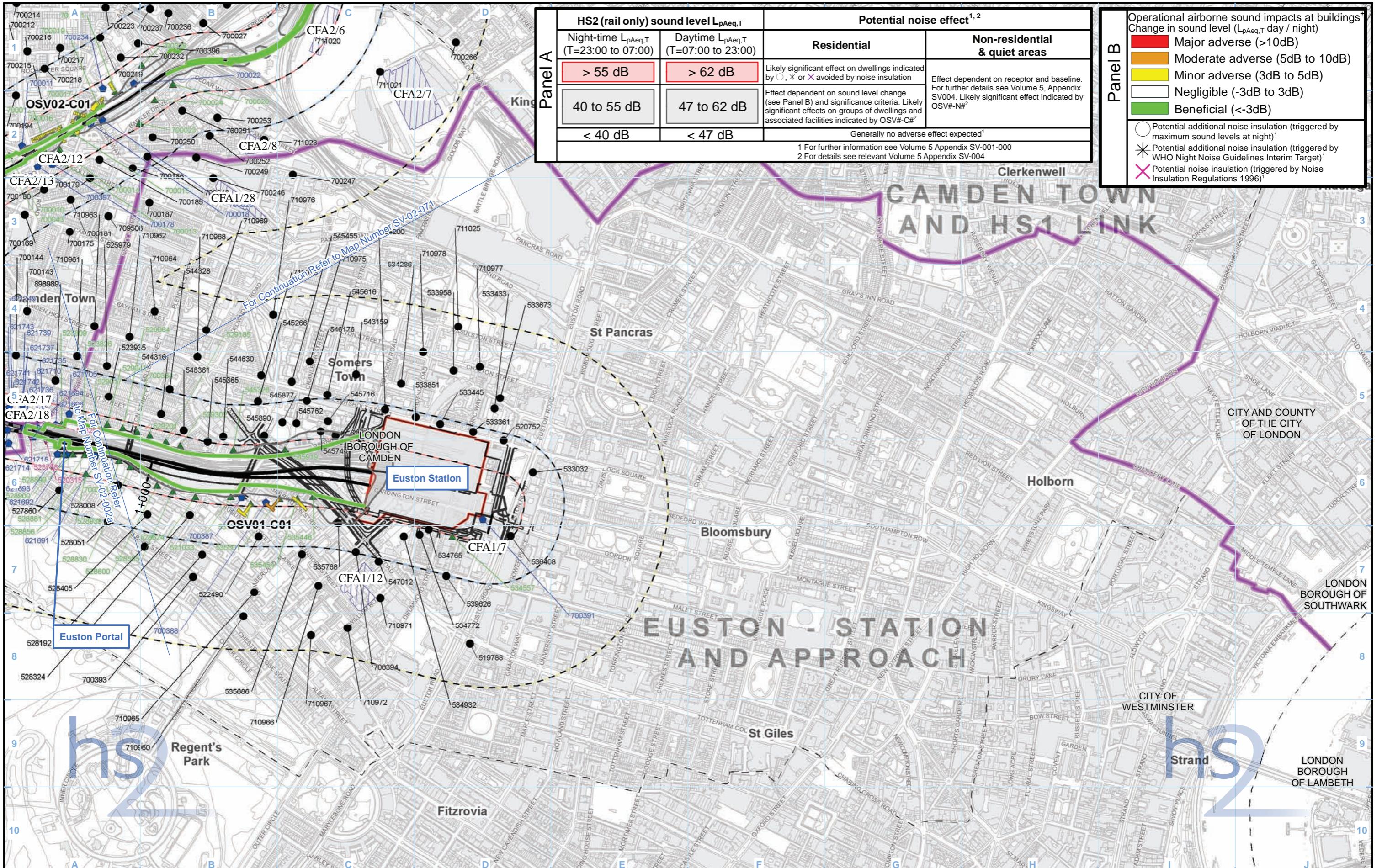


Registered in England. Registration number 06791686.
Registered office: Eland House, Bressenden Place,

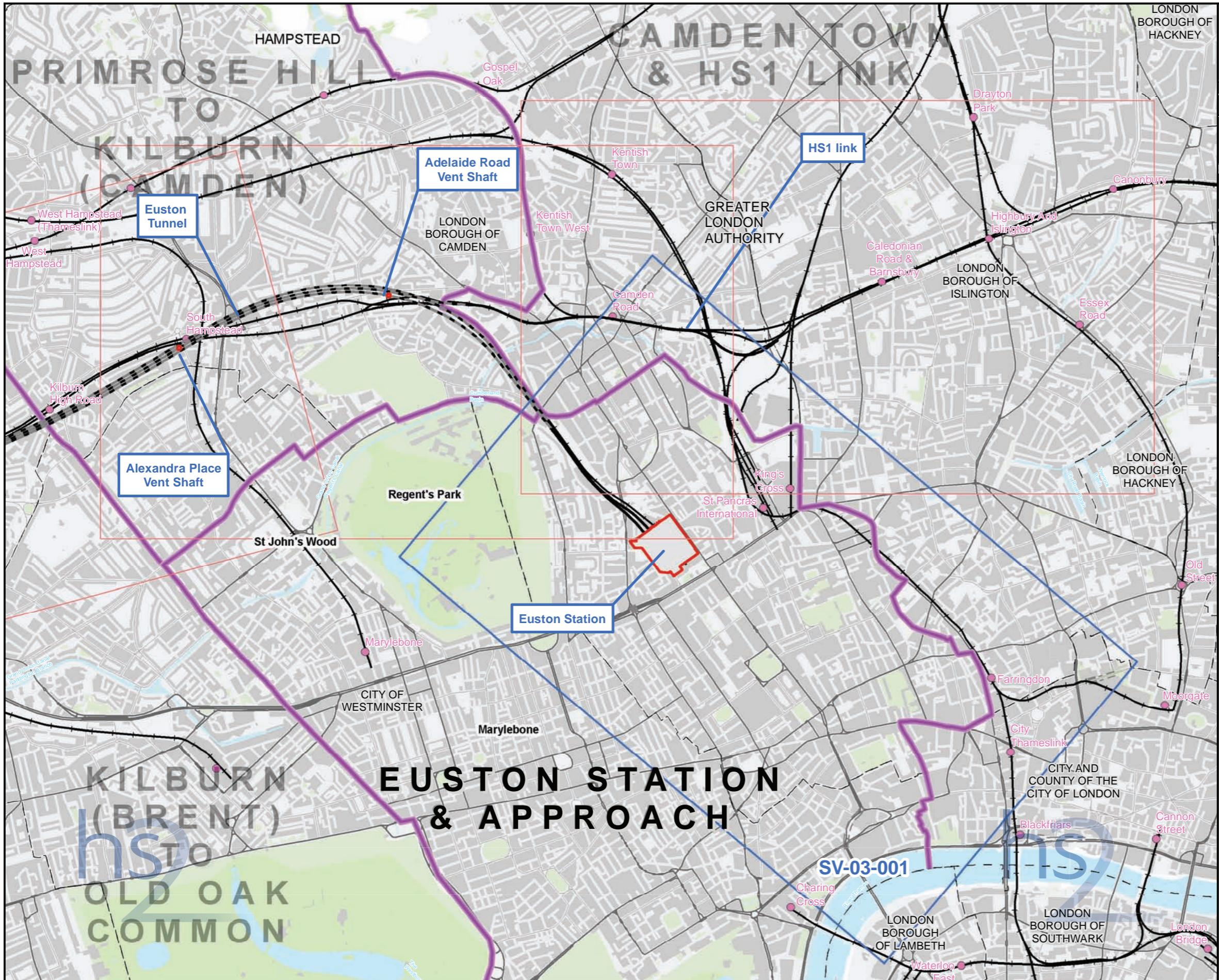
Scale at A3: 1:10,000

Metres

Date: 29/10/13

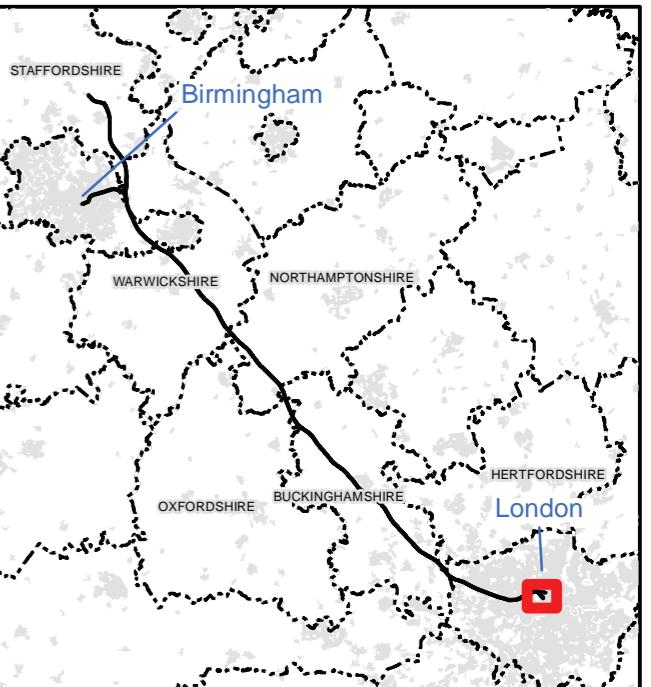


Legend - General features	Legend - Sound related features	Map Number	Map Name	HS2 Ltd accept no responsibility for any circumstances, which arise from the reproduction of this map after alteration, amendment or abbreviation or if it is issued in part or issued incomplete in any way.
<ul style="list-style-type: none"> Route in bored tunnel Route in green tunnel Route on surface Depot, station, headhouse or portal building Community forum boundary District/Borough boundary County boundary 	<ul style="list-style-type: none"> Committed developments (labelled as CFA##) Ground-borne sound & vibration study area (highly sensitive non-residential) Envisaged mitigation to avoid / reduce significant noise effects: Landscaping and/or fence barriers* Engineering e.g. cuttings (green tunnels separately marked) Ground-borne sound & vibration study area (residential and non-residential) Envisaged measures further reducing noise effects: Other environmental features e.g. landscaping Ground-borne sound and/or vibration assessment location Engineering e.g. cuttings Airborne sound, ground-borne sound and vibration assessment location Airborne sound study area Minor ground-borne noise or vibration impact* 	SV-02-001	Operational Noise and Vibration Impacts and Likely Significant Effects (with Assessment Locations)	HS2 Ltd accept no responsibility for any circumstances, which arise from the reproduction of this map after alteration, amendment or abbreviation or if it is issued in part or issued incomplete in any way.
			Community Forum Area CFA01: Euston - Station and Approach	Registered in England. Registration number 06791686. Registered office: Eland House, Bressenden Place, London SW1E 5DU. © Crown copyright and database rights 2013. Ordnance Survey Licence Number 100049190.
				Scale at A3: 1:10,000 Metres 0 100 200 300 400 Date: 29/10/13 Doc Number: C250-ARP-EV-MAP-000-003650



Main Map Legend	
Route in tunnel	Map sheets included
Route on surface	Map sheets not included
Depot, station, headhouse or portal building	in this community forum
Community forum boundary	in this community forum
Existing railway station	
County boundary	
District/Borough boundary	

Map Number	SV-03-INDEX-CFA1
Map Name	Index Map of: Assessment and Monitoring Locations for Construction Sound, Noise & Vibration Assessments
Community Forum Area CFA1: Euston	
Doc Number: C250-ARP-EV-MAP-000-004109-P06.00	



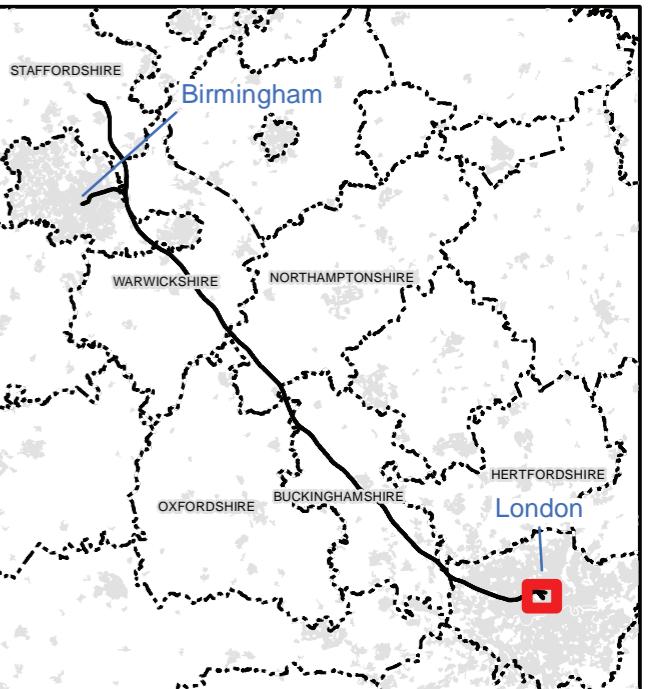
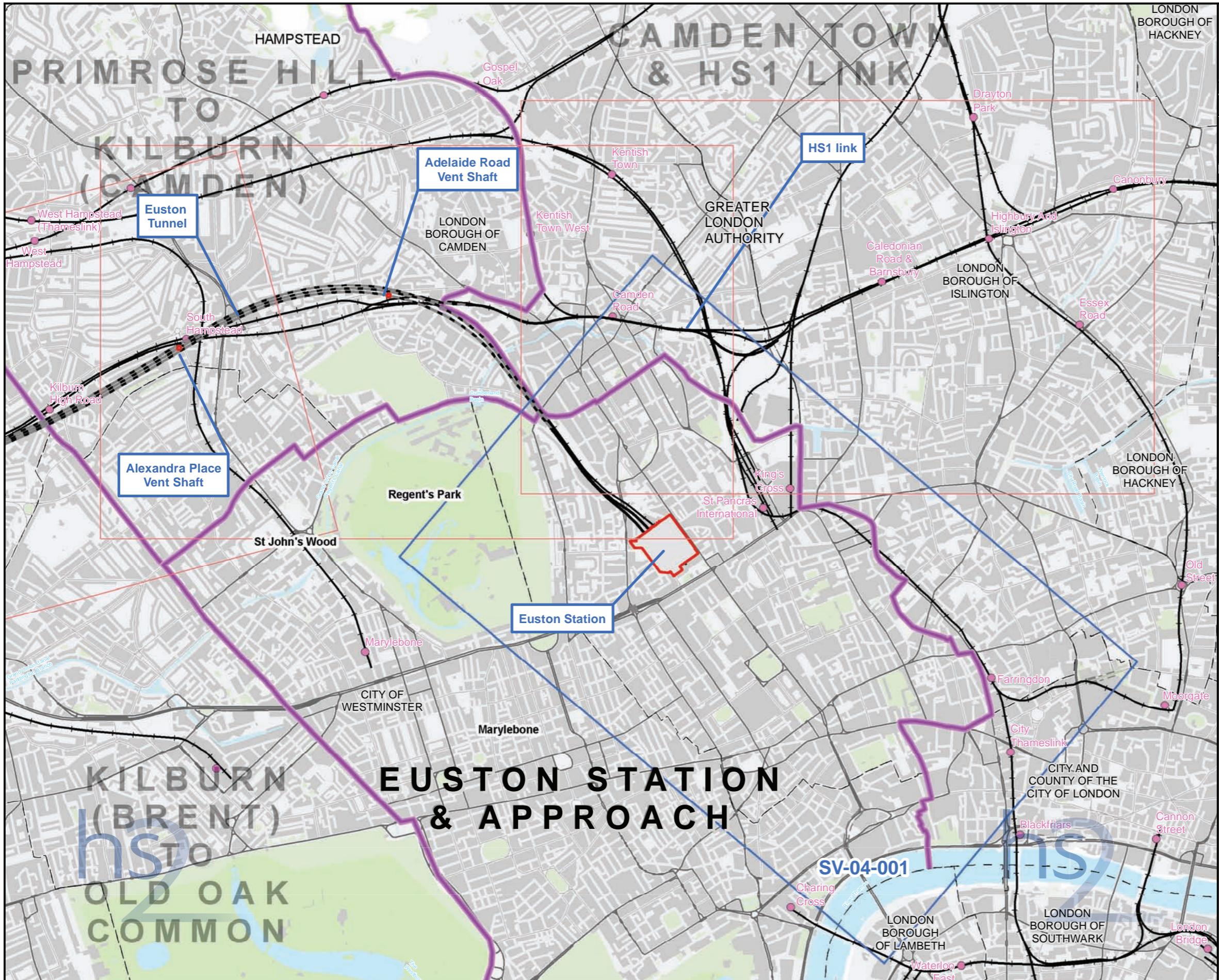
Map Series Information:

The SV-03 figure series accompanies the construction noise & vibration assessments. It shows the locations at which a quantitative assessment of the direct effects of construction noise and/or vibration has been carried out. These are labelled as assessment locations with a reference number to enable cross-reference to the construction noise and vibration reports contained in Volume 5: Appendix SV-003 and Volume 5: Appendix SV-002.

The figure series also shows locations at which baseline sound measurements were carried out. These baseline measurement locations are labelled with a reference number to enable cross-reference to the baseline sound reports contained in Volume 5: Appendix SV-002.

A more detailed explanation of each legend item included on the figures can be found in the data dictionary.

Note: Not all data layers in the legend are represented on every map.



Map Series Information:

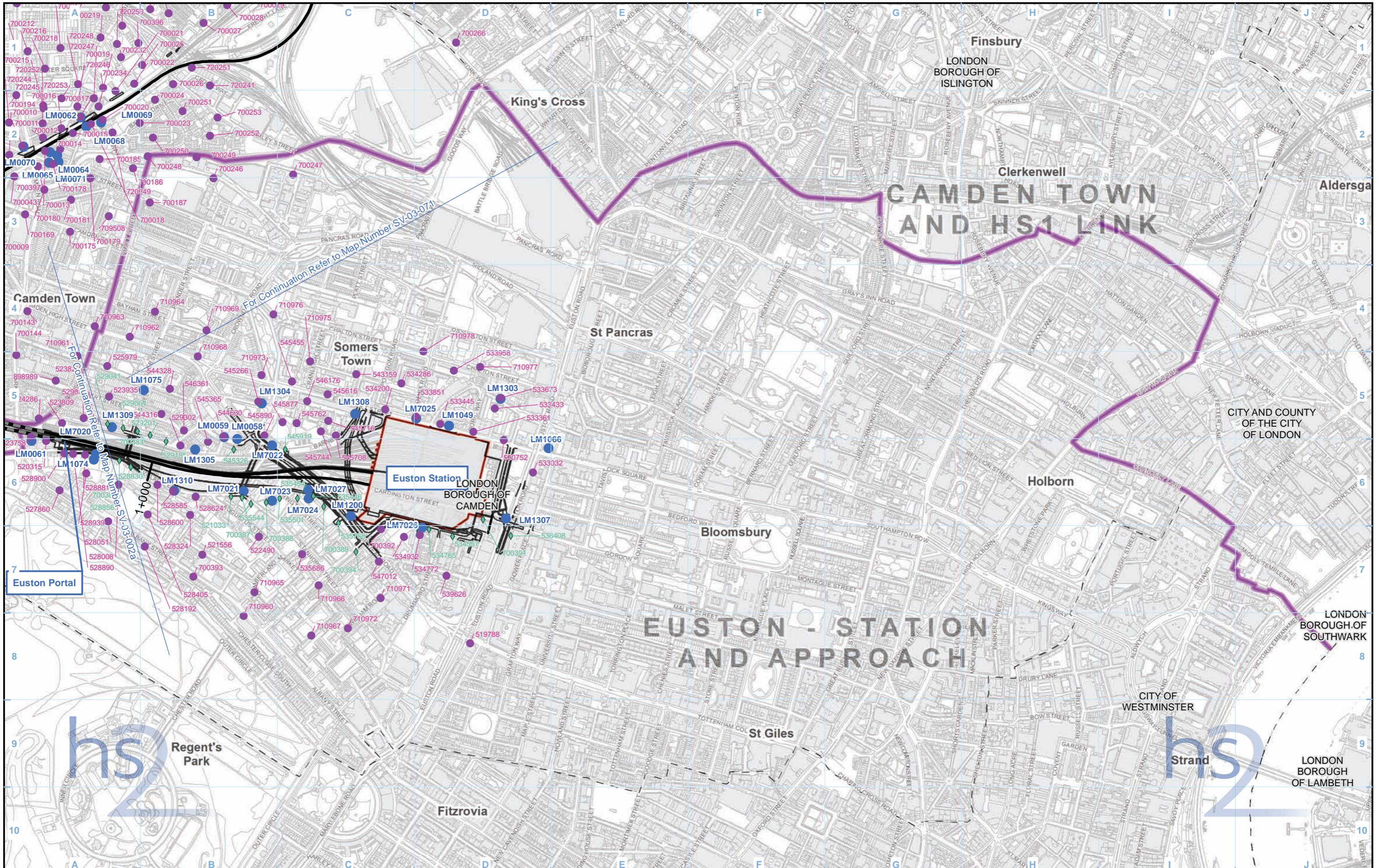
The SV-04 figure series shows the locations at which a quantitative assessment of the direct effects of operational sound and/or vibration has been carried out. These are labelled as assessment locations with a reference number to enable cross-reference to the operational sound and vibration reports contained in Volume 5: Appendix SV-004 and Volume 5: Appendix SV-002.

The figure series also shows locations at which baseline sound measurements were carried out. These baseline measurement locations are labelled with a reference number to enable cross-reference to the baseline sound reports contained in Volume 5: Appendix SV-002.

A more detailed explanation of each legend item included on the figures can be found in the data dictionary.

Note: Not all data layers in the legend are represented on every map.

Map Number	SV-04-INDEX-CFA1
Map Name	Index Map of: Assessment and Monitoring Locations for Operational Sound, Noise & Vibration Assessments
Community Forum Area CFA1: Euston	
Doc Number	C250-ARP-EV-MAP-000-004135-P04.00



Legend - General features

- Route in bored tunnel
- Route in green tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Community forum boundary
- District/Borough boundary
- County boundary

Engineering earthworks: Non engineering earthworks:

	Embankment		Embankment
	Cutting		Cutting

Legend - Sound related features

- Construction airborne sound assessment location
 - Construction vibration assessment locations
 - Construction airborne sound and vibration assessment location
 - Baseline measurement locations
- (labelled with Assessment Location ID reference number (for details of the assessment results see relevant Vol 5 Appendix SV-003))

Map Number	SV-03-001
Map Name	Assessment and Monitoring Locations for Construction Sound, Noise & Vibration Assessments
(labelled with Measurement Location reference code)	
Community Forum Area CFA01:	Euston Station and Approach

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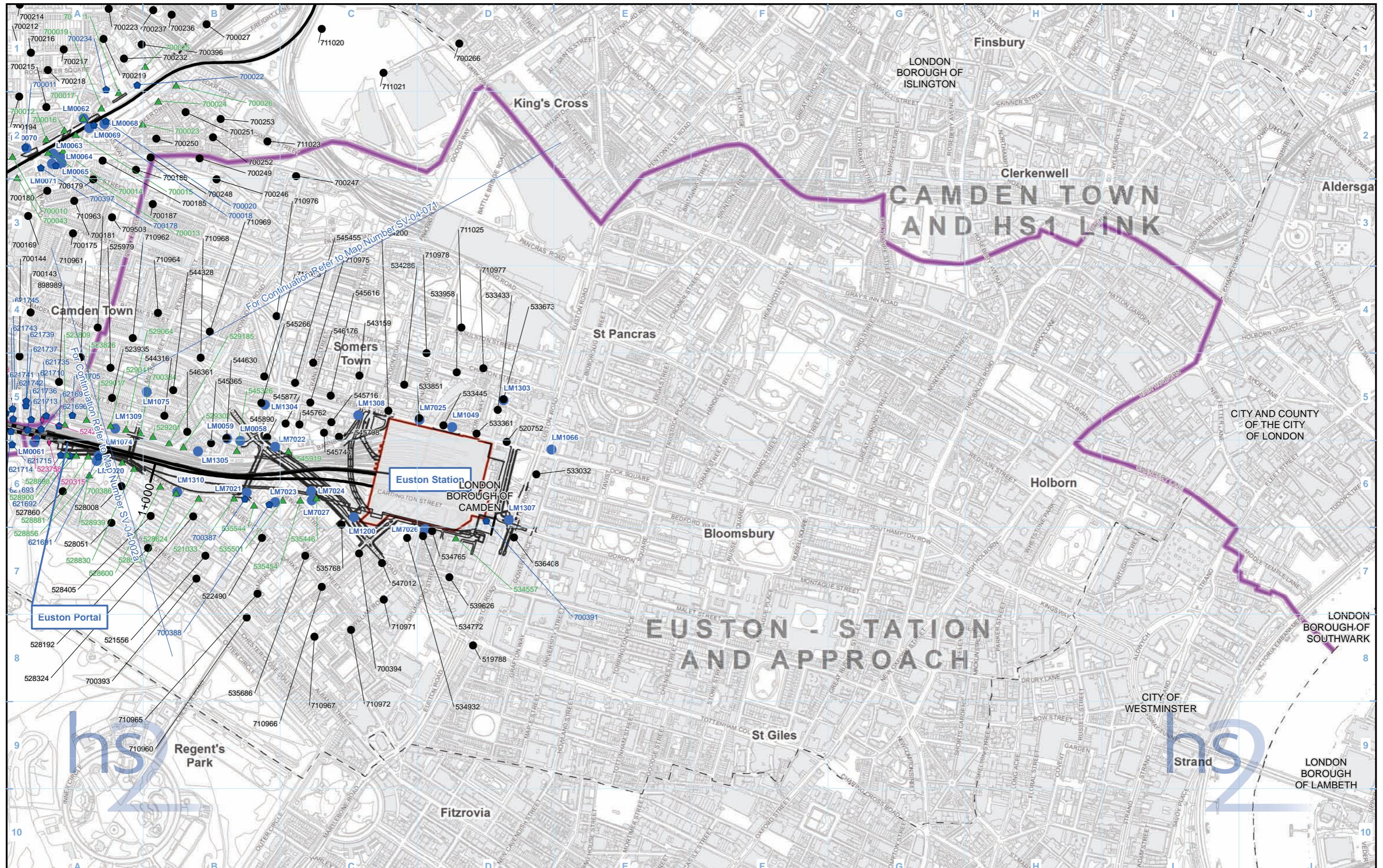
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Scale at A3: 1:10,000

0 100 200 300 400 Metres

Date: 29/10/13

Doc Number: C250-ARP-EV-MAP-000-003751


Legend - General features

- Route in bored tunnel
- Route in green tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Community forum boundary
- - District/Borough boundary
- County boundary

- | | |
|-------------------------|-----------------------------|
| Engineering earthworks: | Non engineering earthworks: |
| | |
| | |
| | |
| | |
| | |
| | |

Legend - Sound related features

- Airborne sound assessment location
- ▲ Airborne sound and vibration assessment location
- ◆ Ground-borne sound and/or vibration assessment location
- ◆ Airborne sound, ground-borne sound and vibration assessment location
- Baseline measurement locations

labelled with Assessment Location ID reference number
(for details of the assessment results see Vol 5 Appendix SV004)

(labelled with Measurement Location reference code)

Map Number
SV-04-001
Map Name

Assessment and Monitoring Locations for Operational Sound, Noise & Vibration Assessments

Community Forum Area CFA01:
Euston Station and Approach



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Date: 29/10/13



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LONDON-WEST MIDLANDS ENVIRONMENTAL STATEMENT

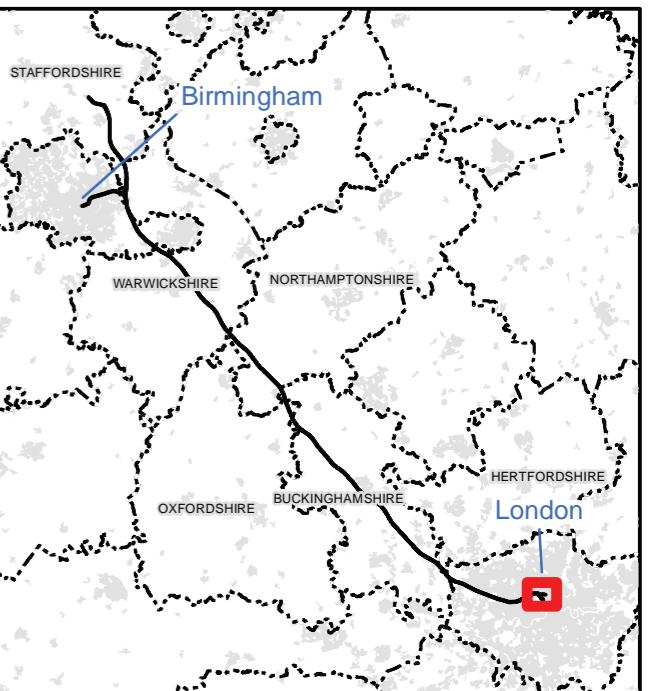
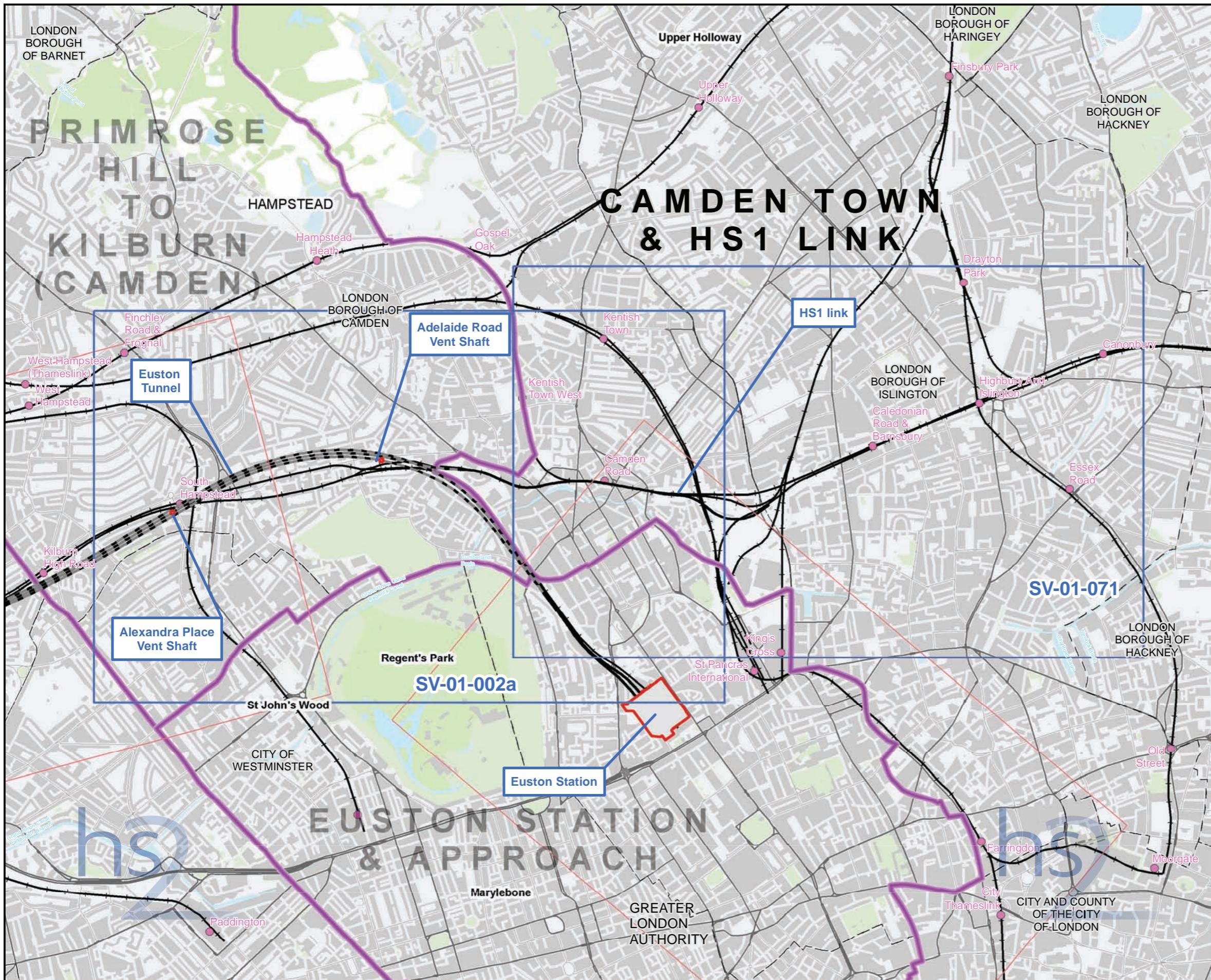
CFA2 | Camden Town and HS1 Link

SV-01 - Operational Sound Contour Maps and Likely Significant Effects

SV-02 - Operational Airborne Noise and Vibration Impacts and Likely Significant Effects
(with Assessment Locations)

SV-03 - Assessment and Monitoring Locations for Construction Sound, Noise & Vibration Assessments

SV-04 - Assessment and Monitoring Locations for Operational Sound, Noise & Vibration Assessments



Map Series Information:

SV-01 presents the predicted operational sound from the new railway.

The sound levels from the new railway (expressed as $L_{pAeq,T}$) are presented in typical noise mapping colours in 5 dB steps. There is a panel at the top right of the figure; the left-hand section of this panel contains a key communicating the night-time and daytime sound levels represented by the various colours. The right-hand part of the same panel contains text explaining how the sound levels presented on the figure inform the assessment of direct noise impacts and likely significant effects. A corresponding and similar panel is found on SV-02, along with the key sound contours that were used within the environmental assessment.

Also presented on SV-01 are the following (which are also included on SV-02):

- A representation of the Proposed Scheme, including the railway alignment (indicating whether it is on the surface or in tunnel), any new and altered roads and all associated engineering and environmental mitigation earthworks;
- blue and green lines representing the wayside airborne noise mitigation measures included in the Proposed Scheme;
- symbols representing buildings that would potentially qualify for noise insulation;
- labels identifying the residual likely significant noise effects of the Proposed Scheme, and
- the extent of the study area within which the direct impacts and effects of the scheme have been quantitatively assessed.

A more detailed explanation of each legend item included on the figures can be found in the data dictionary.

Note: Not all data layers in the legend are represented on every map.

Map Number: SV-01-INDEX-CFA2

Map Name: Index Map of:
Operational Sound Contour Maps and
Likely Significant Effects

Community Forum Area CFA2:
Camden Town & HS1 Link



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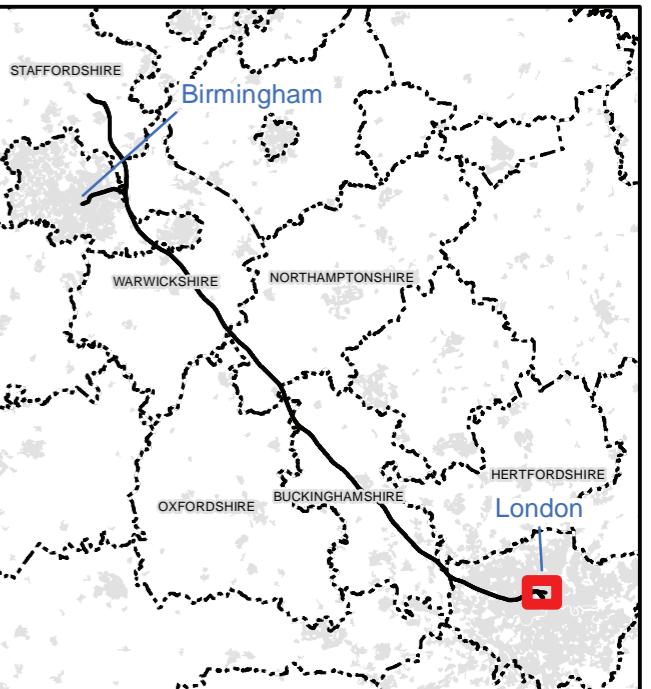
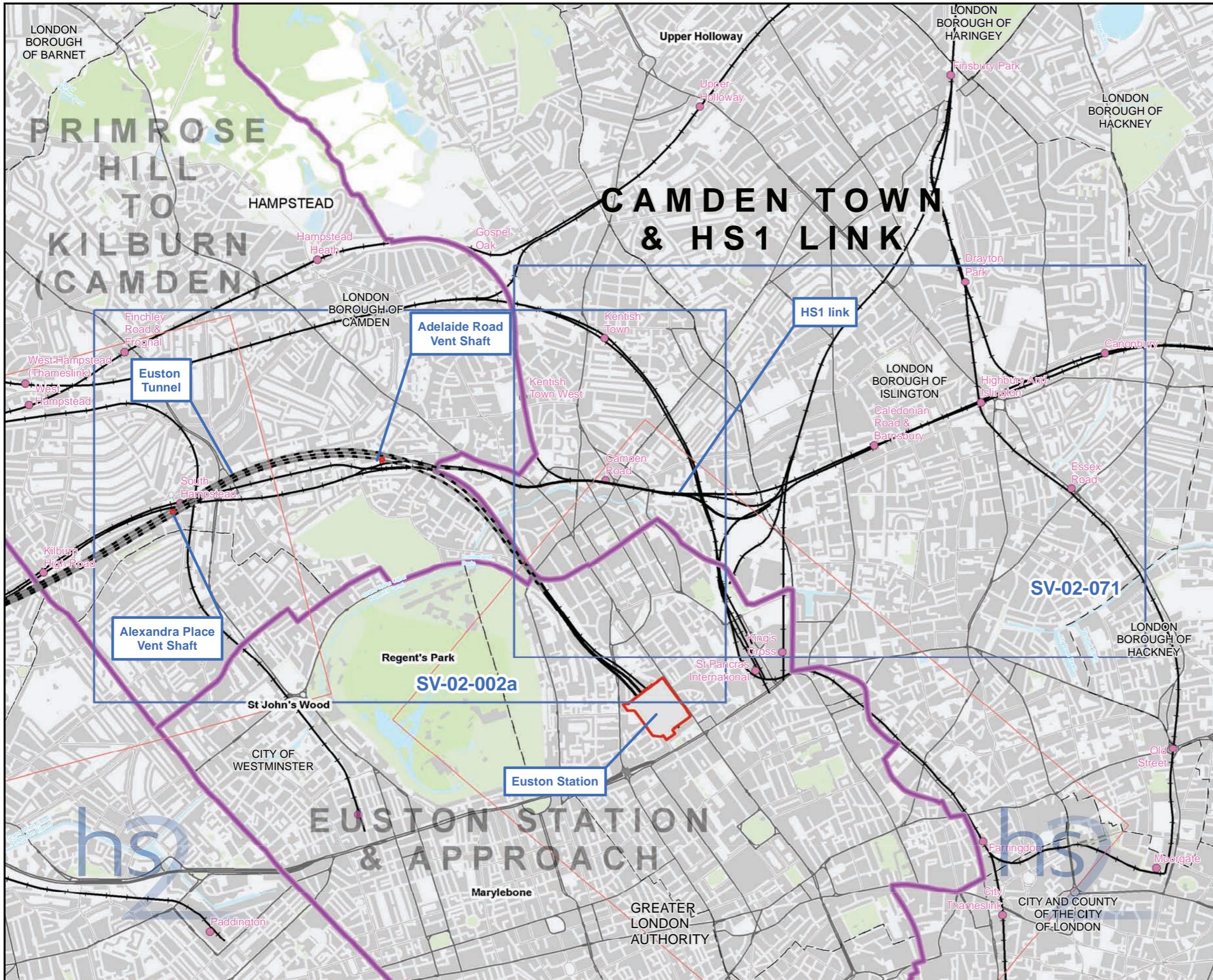
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Date: 29/10/13



Map Series Information:

SV-02 presents the direct operational noise impacts and likely significant effects of the Proposed Scheme.

The SV-02 figure series necessarily contains a large amount of information relating to the operational noise and vibration assessment. It is designed to communicate visually the assessment process from the prediction of impacts to the determination of likely residual significant effects. The corresponding text is included in Vol2 and Vol5.

Key items on the map include the following:

- The Proposed Scheme (the proposed railway alignments and surrounding associated earthworks/roads);
- blue and green lines representing the wayside airborne noise mitigation measures included in the Proposed Scheme;
- the study areas, which indicate the areas within which direct sound and vibration impacts of the scheme have been quantitatively assessed;
- the calculated direct operational impacts of the scheme, displayed as colour-coded buildings and symbols representing buildings that would potentially qualify for noise insulation;
- sound contours representing sound produced by the new railway (displayed in a simpler manner than on SV-01 in order not to obscure other features on the map series);
- the assessment locations at which a quantitative prediction of sound and impacts have been carried out (representing a number of nearby buildings). These are labelled with a unique reference number to enable cross-reference to further detail regarding the assessments in Volume 5: Appendix SV-004; and
- labels indicating where the likely residual direct noise or vibration significant effects have been identified. These are labelled with a unique reference number to enable cross-reference to further detail regarding the assessments in Volume 5: Appendix SV-004.

A more detailed explanation of each legend item included on the figures can be found in the data dictionary.

Note: Not all data layers in the legend are represented on every map.

Map Number SV-02-INDEX-CFA2

Map Name
Index Map of:
Operational Noise and Vibration Impacts and Likely
Significant Effects (with Assessment Locations)

Community Forum Area CFA2:
Camden Town & HS1 Link

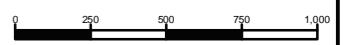


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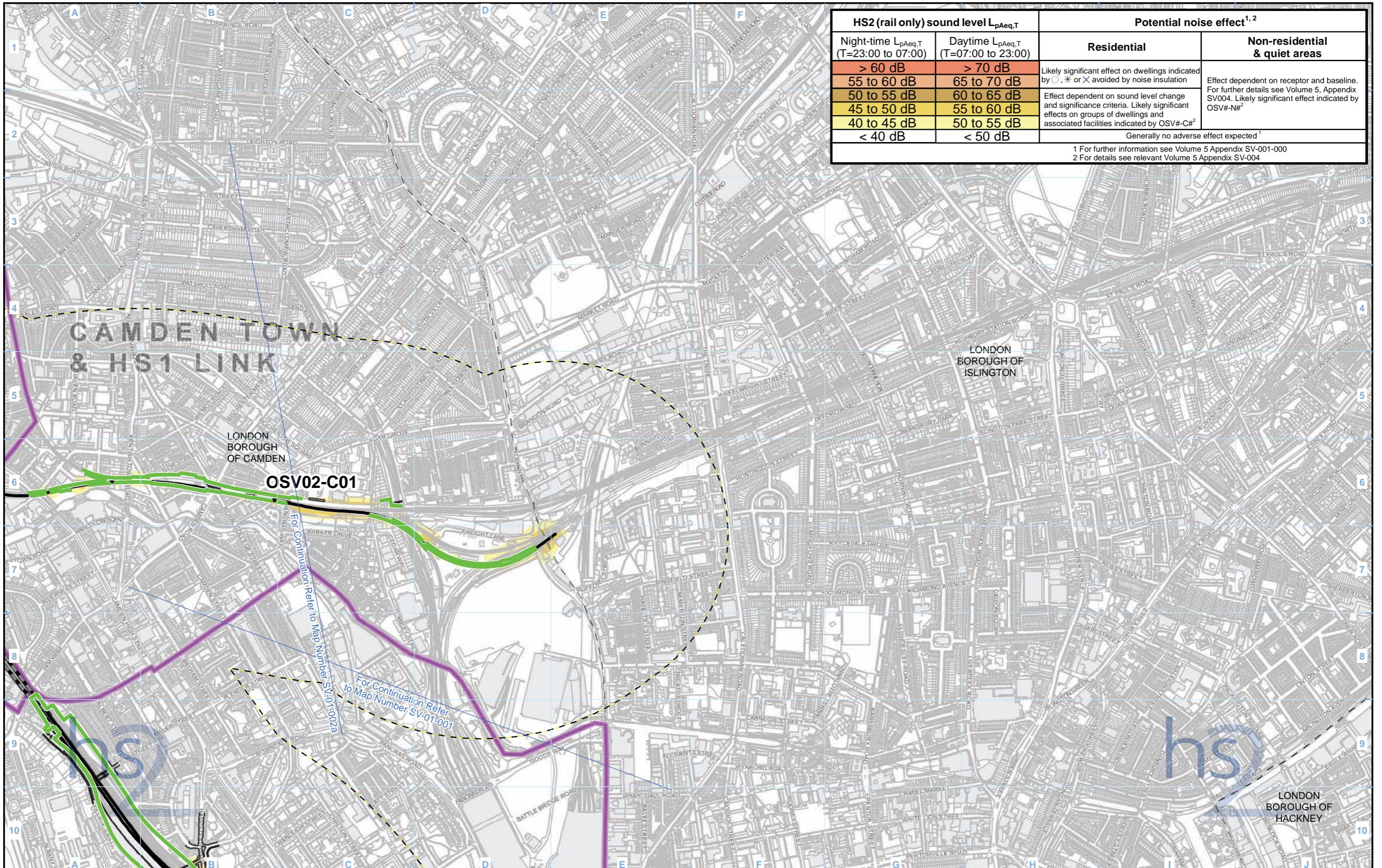
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Doc Number: C250-ARP-EV-MAP-000-004084--P04.00

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Legend - General features

- Route in bored tunnel
- Route in green tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Community forum boundary
- District/Borough boundary
- County boundary

Engineering earthworks:

- Non engineering earthworks:
- Embankment
- Cutting

Legend - Sound related features

Envisaged mitigation to avoid / reduce significant noise effects:

- Landscaping and/or fence barriers*
- Engineering e.g. cuttings (green tunnels separately marked)

Envisaged measures further reducing noise effects:

- Other environmental e.g. landscaping
- Engineering e.g. cuttings

* Labelled with total barrier height above rail level

- Airborne sound study area
- Potential additional noise insulation (triggered by maximum sound levels at night)¹
- Potential additional noise insulation (triggered by WHO Night Noise Guidelines Interim Target)¹
- Potential noise insulation (triggered by Noise Insulation Regulations 1996)¹

Map Number SV-01-071
Map Name Operational Sound Contour Maps and Likely Significant Effects
Community Forum Area CFA02: Camden Town & HS1 Link

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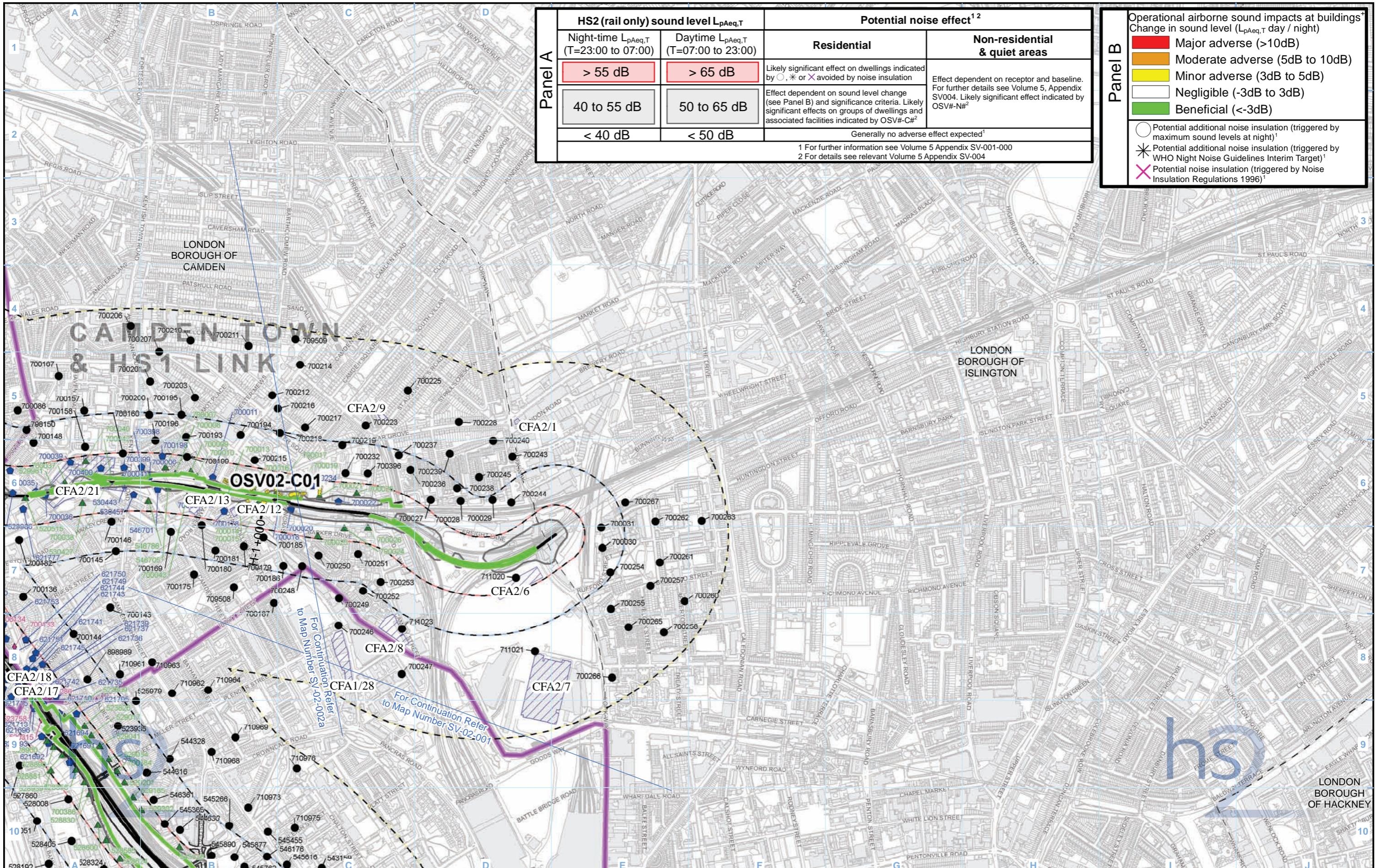
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0 100 200 300 400 Metres

Doc Number: C250-ARP-EV-MAP-000-003551

Date: 29/10/13



Legend - General features

- Route in bored tunnel
- Route in green tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Community forum boundary
- District/Borough boundary
- County boundary

Engineering earthworks:
Non engineering earthworks:
 Embankment
 Cutting

Legend - Sound related features

- Committed developments (label as CFA#/#)
- Ground-borne sound & vibration study area (residential and non-residential)
- Envisaged mitigation to avoid / reduce significant noise effects:
 Landscaping and/or fence barriers*
- Ground-borne sound & vibration study area (highly sensitive non-residential)
- Engineering e.g. cuttings (green tunnels separately marked)
- Airborne sound and vibration assessment location
- Ground-borne sound and/or vibration assessment location
- Other environmental features e.g. landscaping
- Other environmental features e.g. landscaping
- Airborne sound, ground-borne sound and vibration assessment location
- Minor ground-borne noise or vibration impact*

* Residential buildings only
* Labelled with total barrier height above rail level

Map Number
SV-02-071
Map Name
Operational Noise and Vibration Impacts and Likely Significant Effects (with Assessment Locations)

Community Forum Area CFA02:
Camden Town & HS1 Link



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Date: 31/10/13

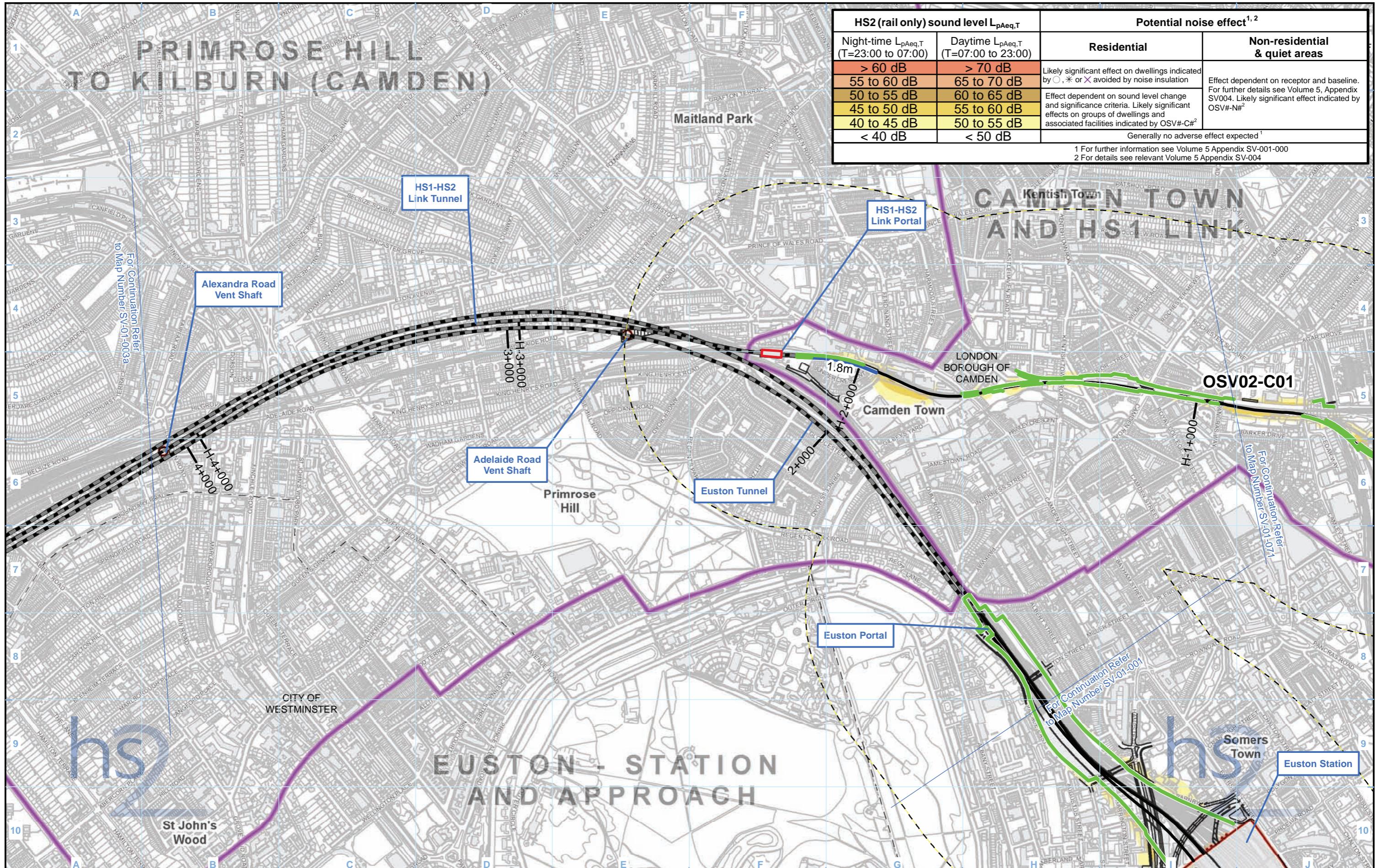
Operational airborne sound impacts at buildings¹
Change in sound level ($L_{pAeq,T}$ day / night)

Major adverse (>10dB)
Moderate adverse (5dB to 10dB)
Minor adverse (3dB to 5dB)
Negligible (-3dB to 3dB)
Beneficial (<-3dB)

○ Potential additional noise insulation (triggered by maximum sound levels at night)¹

✖ Potential additional noise insulation (triggered by WHO Night Noise Guidelines Interim Target)¹

✖ Potential noise insulation (triggered by Noise Insulation Regulations 1996)¹



HS2 (rail only) sound level $L_{pAeq,T}$		Potential noise effect ^{1, 2}	
Night-time $L_{pAeq,T}$ (T=23:00 to 07:00)	Daytime $L_{pAeq,T}$ (T=07:00 to 23:00)	Residential	Non-residential & quiet areas
> 60 dB	> 70 dB	Likely significant effect on dwellings indicated by ○, * or ✕ avoided by noise insulation	Effect dependent on receptor and baseline. For further details see Volume 5, Appendix SV004. Likely significant effect indicated by OSV#-N# ²
55 to 60 dB	65 to 70 dB		
50 to 55 dB	60 to 65 dB	Effect dependent on sound level change and significance criteria. Likely significant effects on groups of dwellings and associated facilities indicated by OSV#-C# ²	Effect dependent on receptor and baseline. For further details see Volume 5, Appendix SV004. Likely significant effect indicated by OSV#-N# ²
45 to 50 dB	55 to 60 dB		
40 to 45 dB	50 to 55 dB		
< 40 dB	< 50 dB	Generally no adverse effect expected ¹	

1 For further information see Volume 5 Appendix SV-001-000
2 For details see relevant Volume 5 Appendix SV-004

2 For details see relevant Volume 5 Appendix SV-004

Legend - General features

- Route in bored tunnel
 - Route in green tunnel
 - Route on surface
 - Depot, station, headhouse or portal building
 - Community forum boundary
 - District/Borough boundary
 - County boundary

1 / 1

- Engineering earthworks: M

1

- engineering earthwork

Legend - Sound related features

- Envisaged mitigation to avoid / reduce significant noise effects:
 - Landscaping and/or fence barriers*
 - Engineering e.g. cuttings (green tunnels separately marked)
 - Envisaged measures further reducing noise effects:
 - ■ | Other environmental e.g. landscaping
 - ■ | Engineering e.g. cuttings

10 of 10

-  Airborne sound study area
 -  Potential additional noise insulation (triggered by maximum sound levels at night)¹
 -  Potential additional noise insulation (triggered by WHO Night Noise Guidelines Interim Target)¹
 -  Potential noise insulation (triggered by Noise Insulation Regulations 1996)¹

* Labelled with total barrier height above rail level

Map Number	SV-01-002a
Map Name	Operational Sound Contour Maps and Likely Significant Effects
Community Forum Area CFA02: Camden Town & HS1 Link	



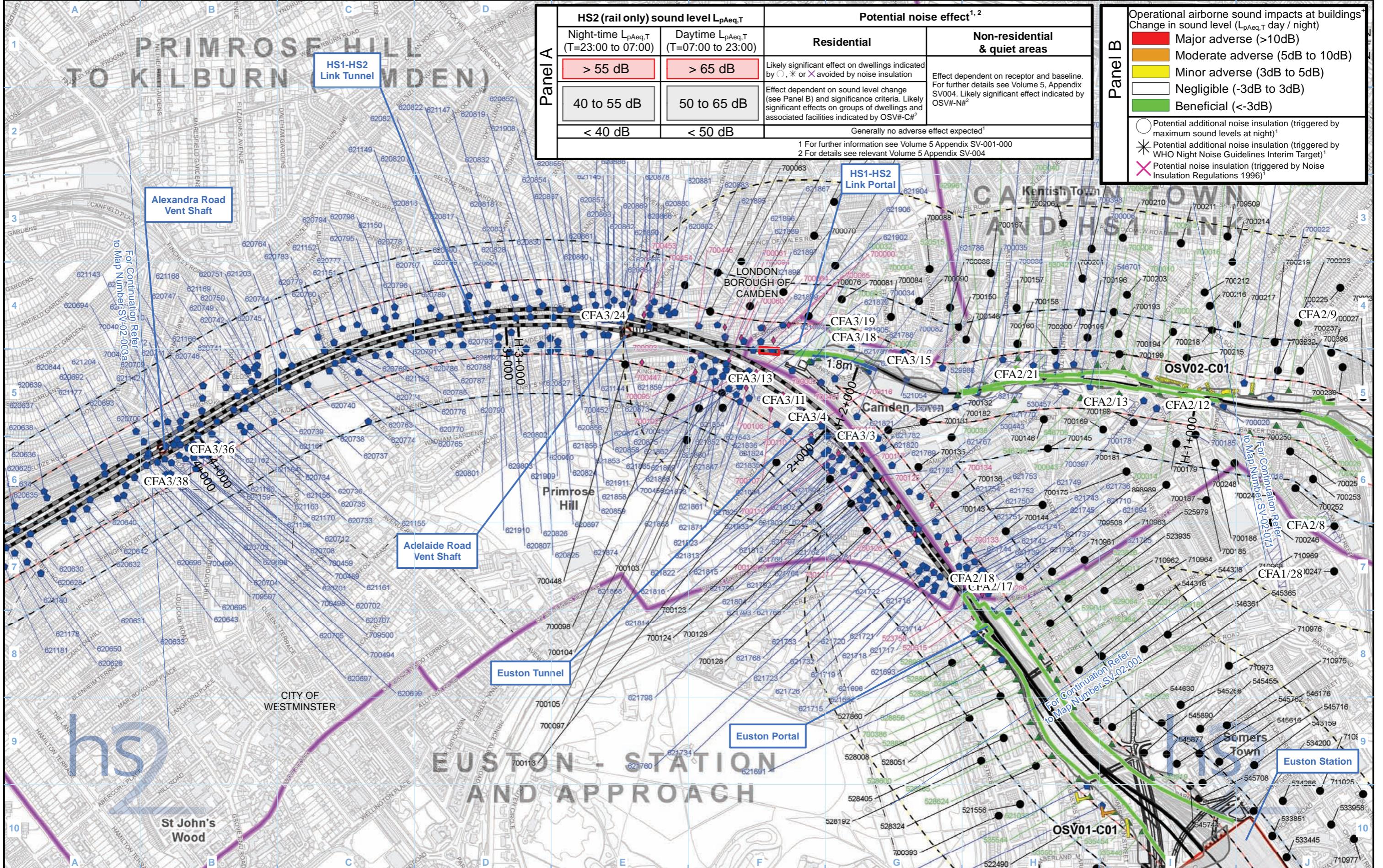
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Legend - General features

- Route in bored tunnel
- Route in green tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Community forum boundary
- District/Borough boundary
- County boundary

Engineering earthworks:

- Non engineering earthworks: Embankment
- Cutting

Engineering earthworks:

- Non engineering earthworks: Embankment
- Cutting

* Residential buildings only

* Labelled with total barrier height above rail level

Legend - Sound related features

- Committed developments (labelled as CFA##)
- Ground-borne sound & vibration study area (highly sensitive non-residential)
- Airborne sound assessment location
- Engineering e.g. cuttings (green tunnels separately marked)
- Ground-borne sound and/or vibration assessment location
- Other environmental features e.g. landscaping
- Airborne sound, ground-borne sound and vibration assessment location
- Minor ground-borne noise or vibration impact*

Map Number: SV-02-002a
Map Name: Operational Noise and Vibration Impacts and Likely Significant Effects (with Assessment Locations)

Community Forum Area CFA02:
Camden Town & HS1 Link

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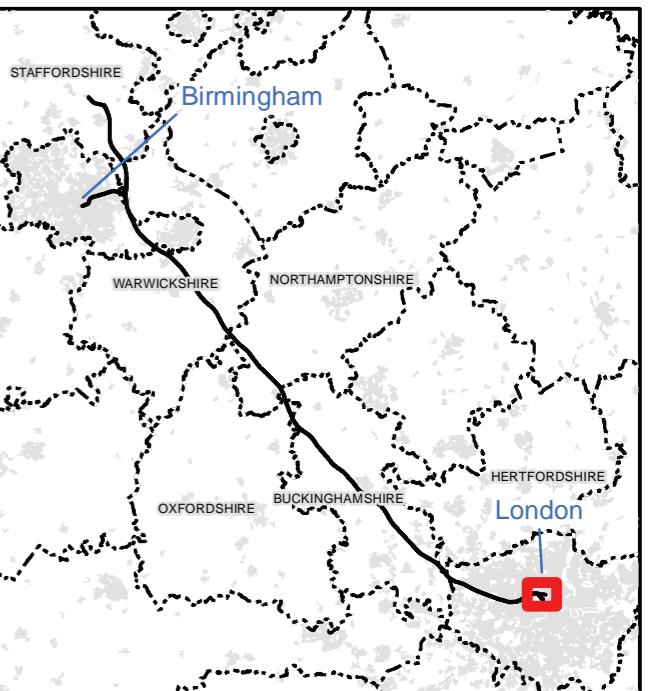
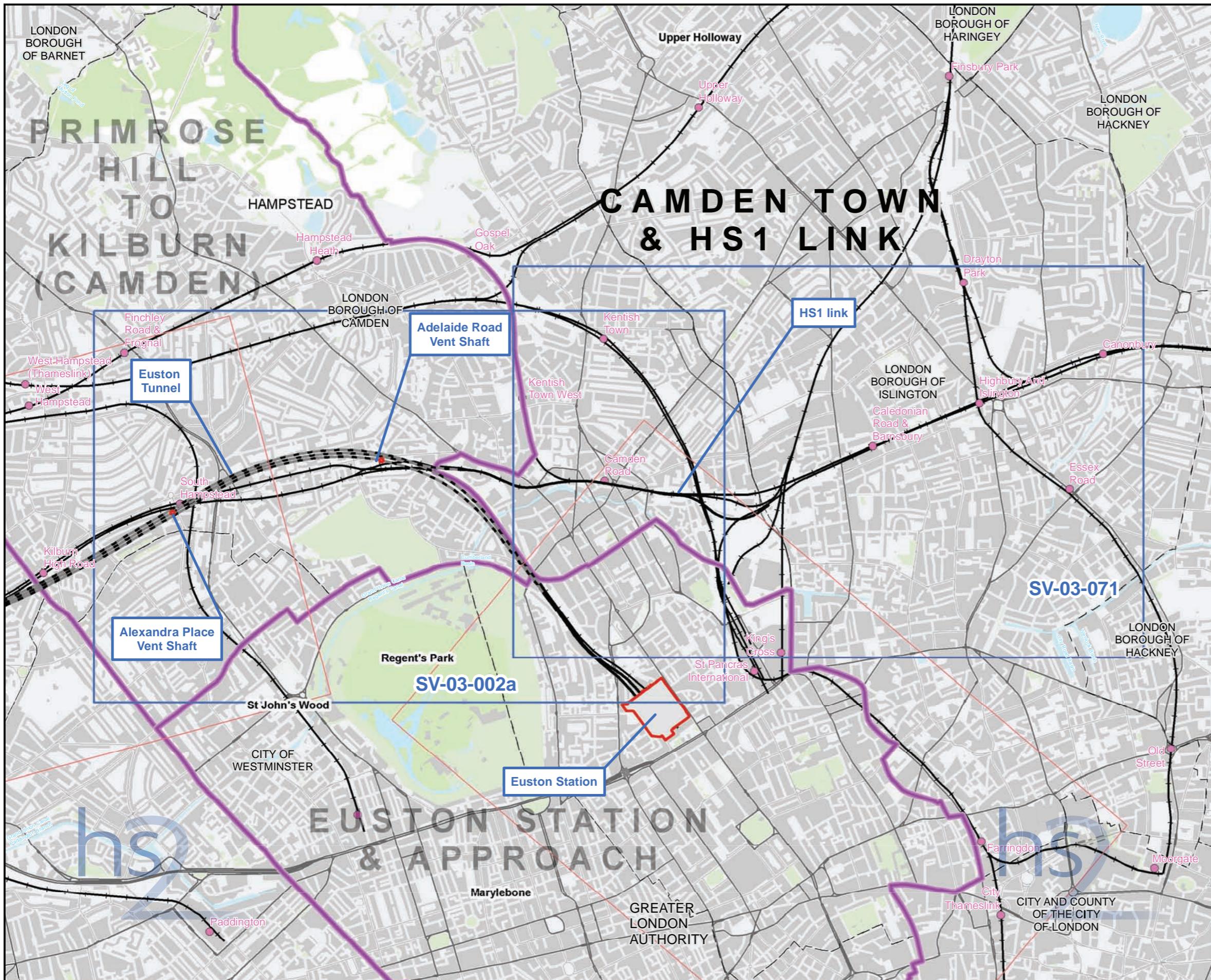
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Metres

Date: 29/10/13



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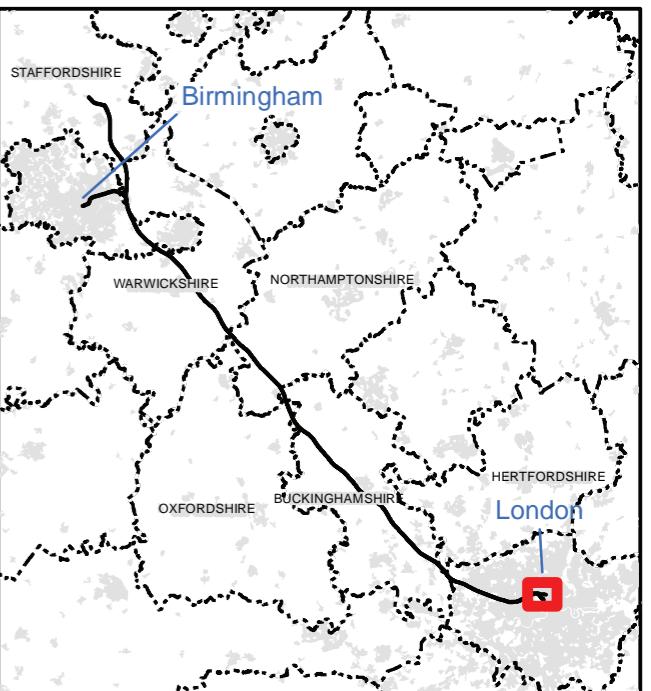
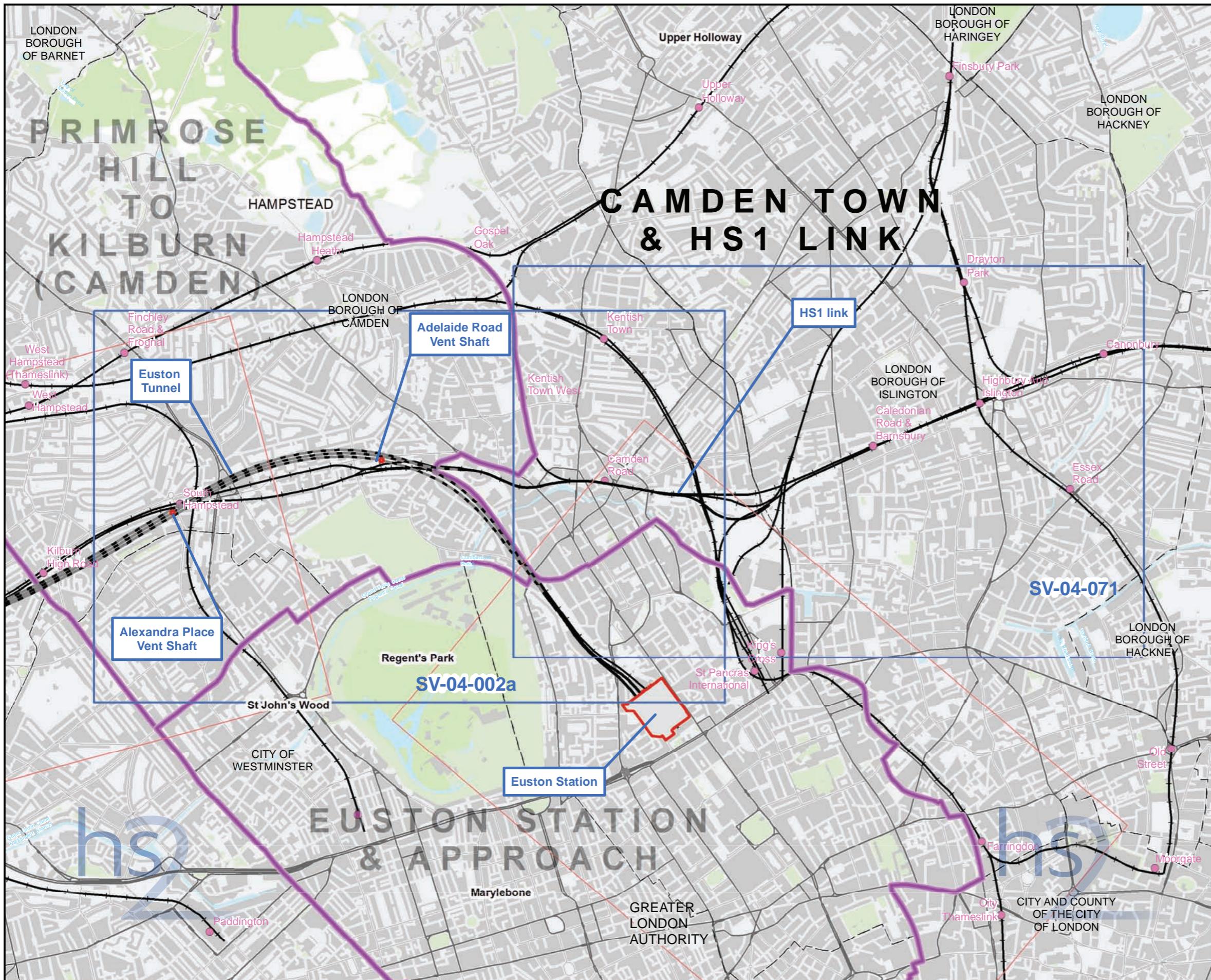
The SV-03 figure series accompanies the construction noise & vibration assessments. It shows the locations at which a quantitative assessment of the direct effects of construction noise and/or vibration has been carried out. These are labelled as assessment locations with a reference number to enable cross-reference to the construction noise and vibration reports contained in Volume 5: Appendix SV-003 and Volume 5: Appendix SV-002.

The figure series also shows locations at which baseline sound measurements were carried out. These baseline measurement locations are labelled with a reference number to enable cross-reference to the baseline sound reports contained in Volume 5: Appendix SV-002.

A more detailed explanation of each legend item included on the figures can be found in the data dictionary.

Note: Not all data layers in the legend are represented on every map.

Map Number	SV-03-INDEX-CFA2
Map Name	Index Map of: Assessment and Monitoring Locations for Construction Sound, Noise & Vibration Assessments
Community Forum Area CFA2: Camden Town & HS1 Link	
Scale at A3: 1:25,000	



Map Series Information:

The SV-04 figure series shows the locations at which a quantitative assessment of the direct effects of operational sound and/or vibration has been carried out. These are labelled as assessment locations with a reference number to enable cross-reference to the operational sound and vibration reports contained in Volume 5: Appendix SV-004 and Volume 5: Appendix SV-002.

The figure series also shows locations at which baseline sound measurements were carried out. These baseline measurement locations are labelled with a reference number to enable cross-reference to the baseline sound reports contained in Volume 5: Appendix SV-002.

A more detailed explanation of each legend item included on the figures can be found in the data dictionary.

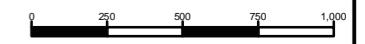
Note: Not all data layers in the legend are represented on every map.

Map Number	SV-04-INDEX-CFA2
Map Name	Index Map of: Assessment and Monitoring Locations for Operational Sound, Noise & Vibration Assessments
Community Forum Area CFA2: Camden Town & HS1 Link	
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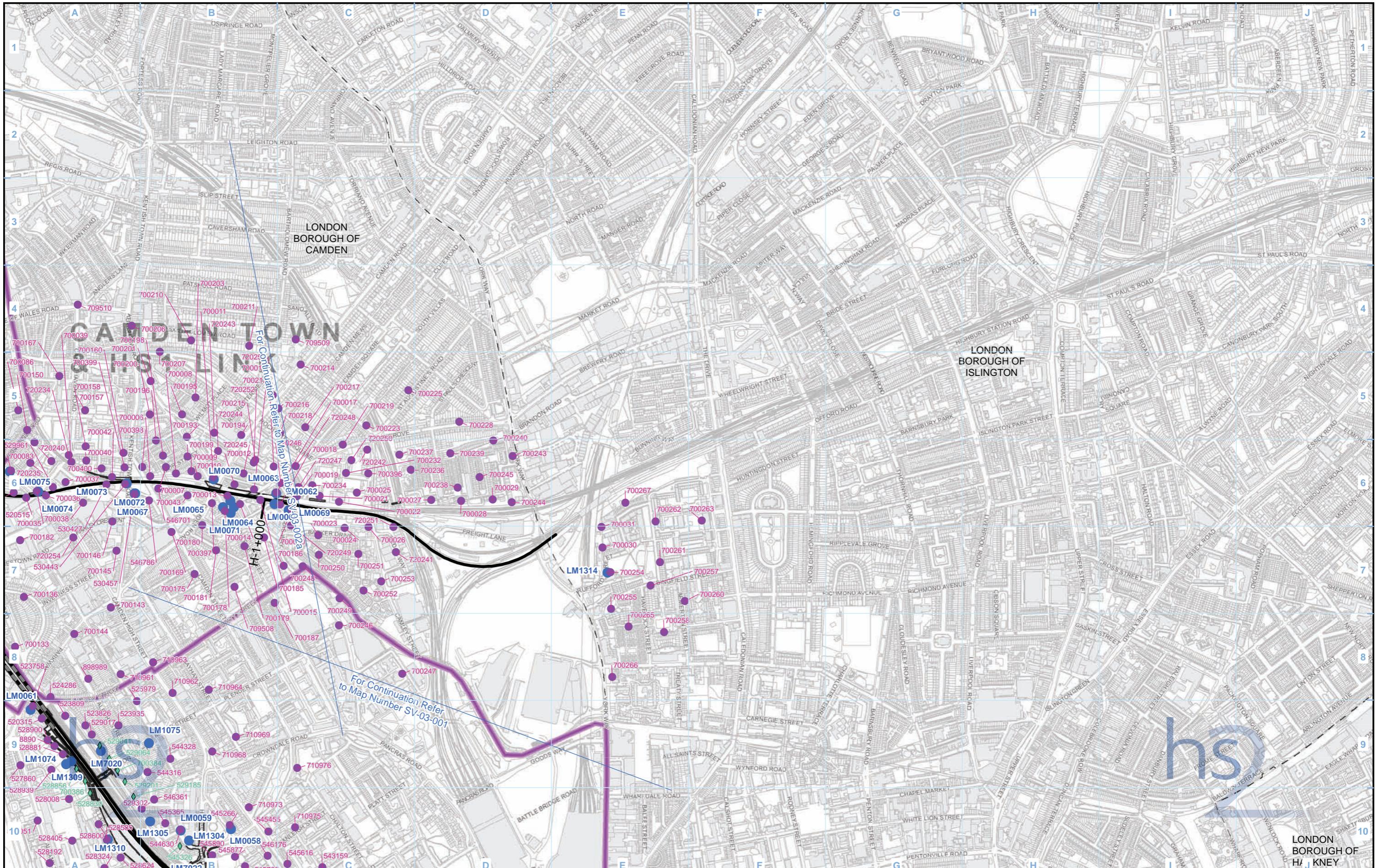
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Date: 29/10/13

Doc Number: C250-ARP-EV-MAP-000-004136-P04.00



Legend - General features

- Route in bored tunnel
- Route in green tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Community forum boundary
- District/Borough boundary
- County boundary

Legend - Sound related features

- Engineering earthworks: Embankment, Cutting
- Non engineering earthworks: Embankment, Cutting
- Construction airborne sound assessment location
- Construction vibration assessment locations
- Construction airborne sound and vibration assessment location
- Baseline measurement locations

Map Number SV-03-071

Map Name Assessment and Monitoring Locations for Construction Sound, Noise & Vibration Assessments

(labelled with Measurement Location reference code)

Community Forum Area CFA02: Camden Town & HS1 Link

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Metres

Date: 29/10/13



Legend - General features

- Route in bored tunnel
- Route in green tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Community forum boundary
- District/Borough boundary
- County boundary

- Engineering earthworks:
- Embankment
 - Cutting

Legend - Sound related features

- Airborne sound assessment location
- ▲ Airborne sound and vibration assessment location
- ◆ Ground-borne sound and/or vibration assessment location
- ◆ Airborne sound, ground-borne sound and vibration assessment location
- Baseline measurement locations

labelled with Assessment Location ID reference number
(for details of the assessment results see Vol 5 Appendix SV004)

(labelled with Measurement Location reference code)

Map Number

SV-04-071

Map Name

Assessment and Monitoring Locations for
Operational Sound, Noise & Vibration
Assessments

Community Forum Area CFA02:
Camden Town & HS1 Link



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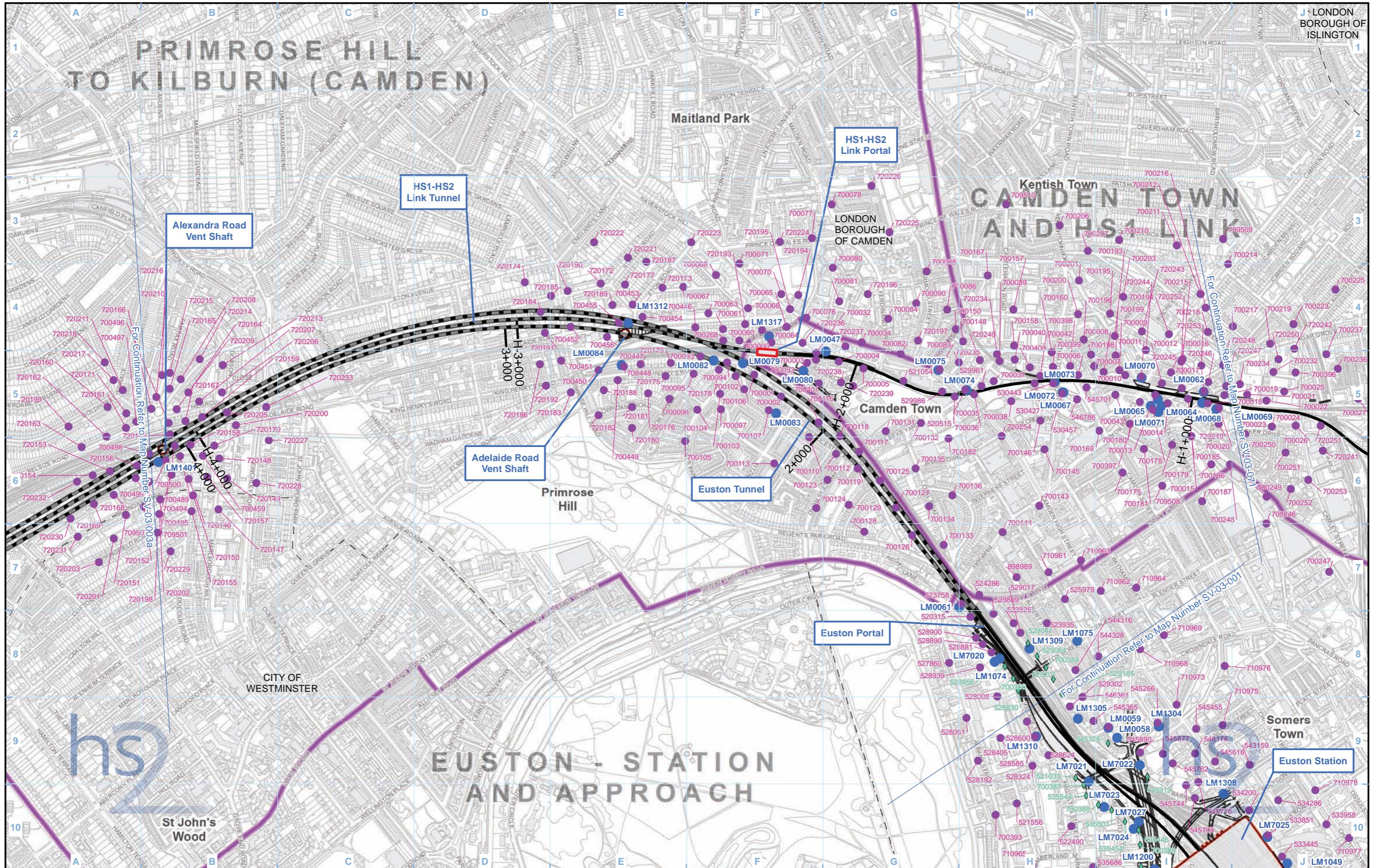
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Scale at A3: 1:10,000

0 100 200 300 400 Metres

Date: 29/10/13

Doc Number: C250-ARP-EV-MAP-000-003855



Legend - General features

- Route in bored tunnel
 - Route in green tunnel
 - Route on surface
 - Depot, station, headhouse or portal building
 - Community forum boundary
 - District/Borough boundary
 - County boundary

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- | Engineering earthworks: | Non engineering earthworks: |
|-------------------------|-----------------------------|
| | |
| Embankment | Embankment |
| | |
| Cutting | Cutting |

Legend - Sound related features

- Construction airborne sound assessment location
 - ◆ Construction vibration assessment locations
 - ◆ Construction airborne sound and vibration assessment location
 - Baseline measurement locations

labelled with Assessment Location ID reference number

(for details of the assessment results see relevant Vol 5 Appendix SV-003)

(labelled with Measurement Location reference code)

Map Number

SV-03-002a

Map Name

Assessment and Monitoring Locations for Construction Sound, Noise & Vibration Assessments

Community Forum Area CFA02
Camden Town & HS1 Link

hs2

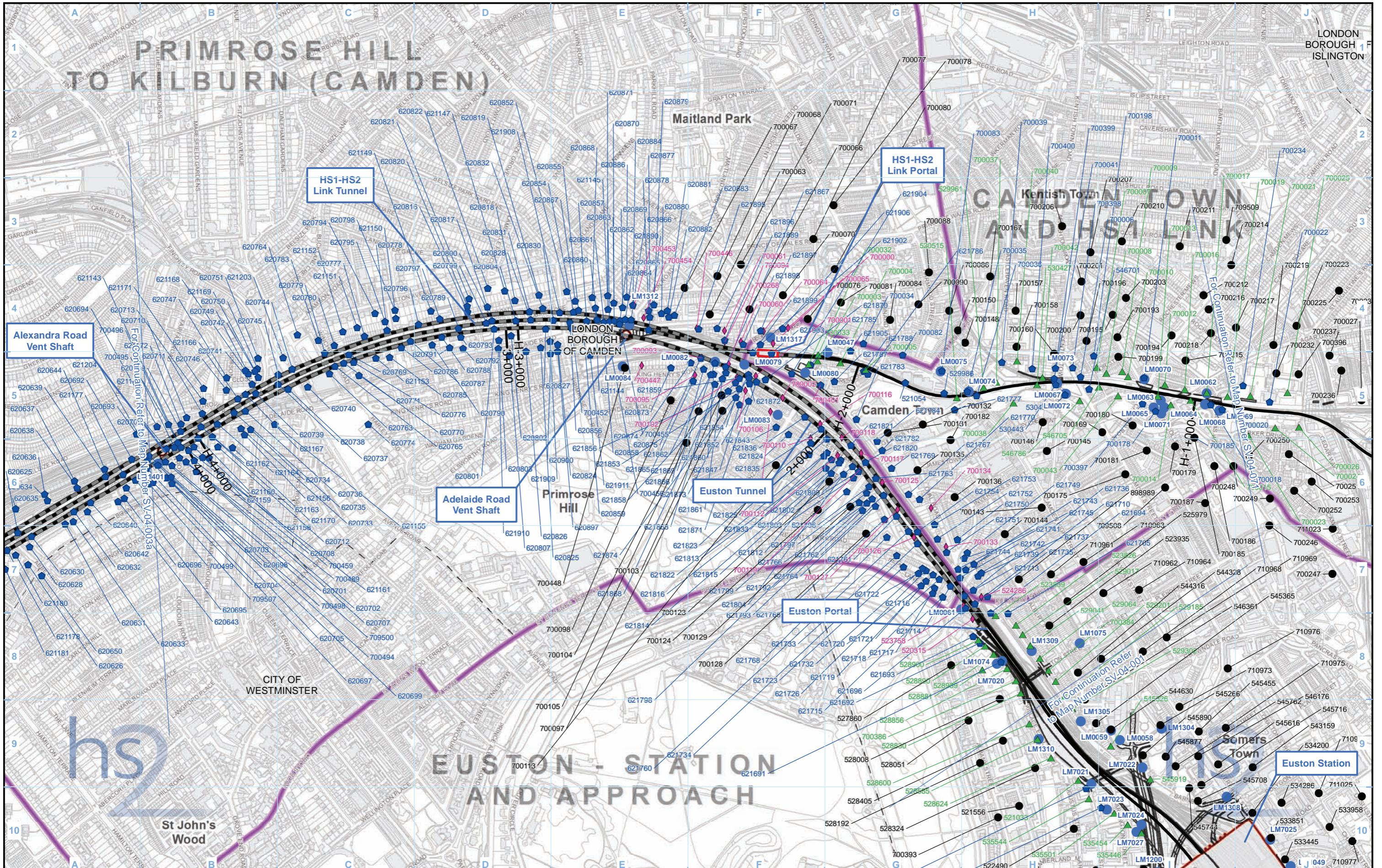
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Scale at A3: 1:10,000

Date: 29/10/13


Legend - General features

- Route in bored tunnel
- Route in green tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Community forum boundary
- District/Borough boundary
- County boundary

- Engineering earthworks:
- | | |
|------------|---------|
| Embankment | Cutting |
| Embankment | Cutting |

Legend - Sound related features

- Airborne sound assessment location
- Airborne sound and vibration assessment location
- Ground-borne sound and/or vibration assessment location
- Airborne sound, ground-borne sound and vibration assessment location
- Baseline measurement locations

labelled with Assessment Location ID reference number
(for details of the assessment results see Vol 5 Appendix SV004)

(labelled with Measurement Location reference code)

Map Number
SV-04-002a
Map Name
Assessment and Monitoring Locations for Operational Sound, Noise & Vibration Assessments

 Community Forum Area CFA02:
Camden Town & HS1 Link


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Doc Number: C250-ARP-EV-MAP-000-003853



Scale at A3: 1:10,000

Date: 29/10/13



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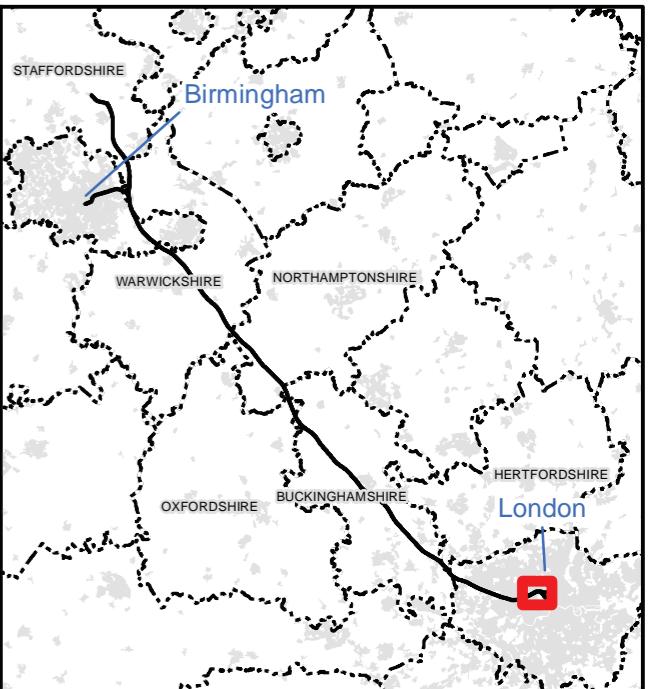
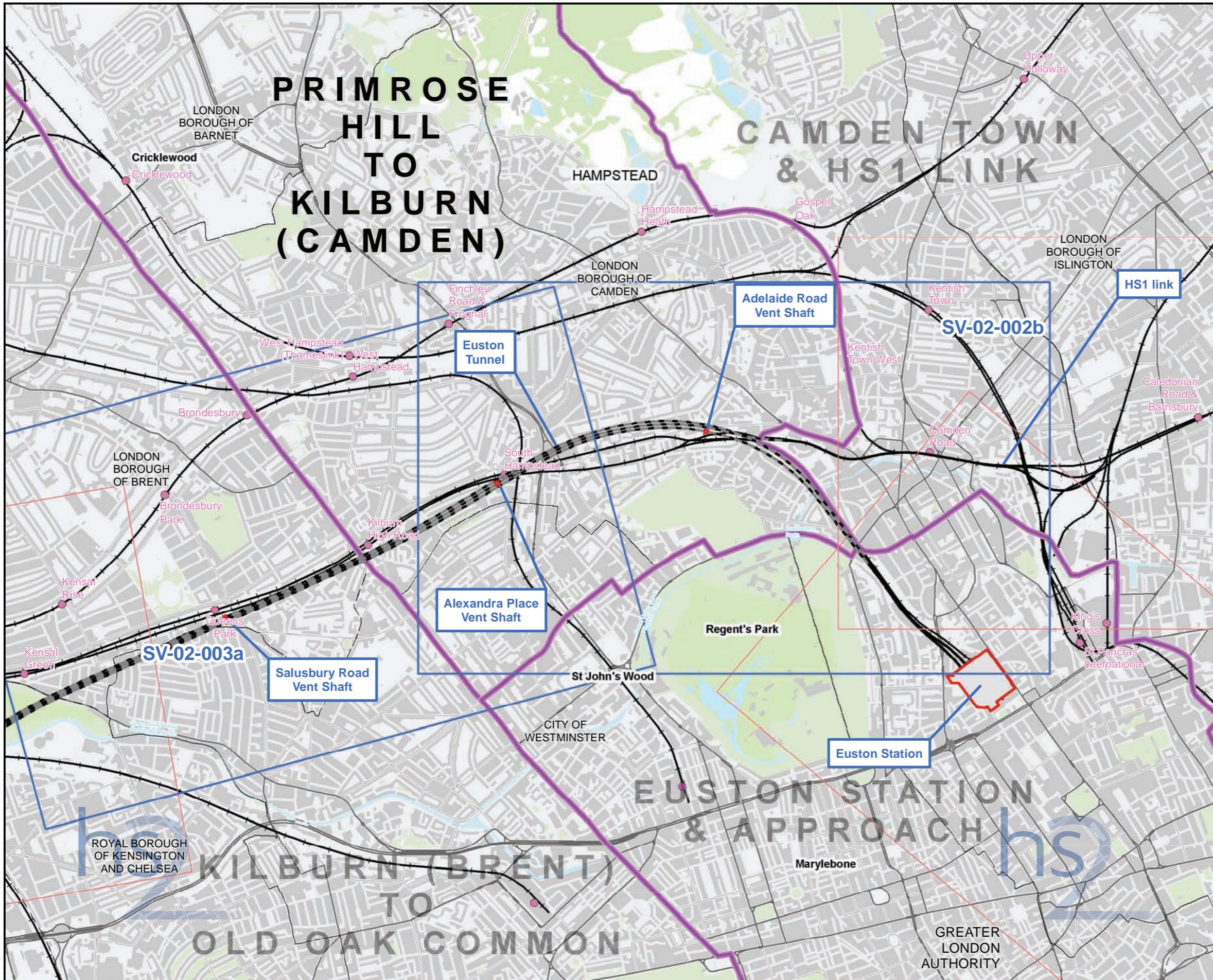
LONDON-WEST MIDLANDS ENVIRONMENTAL STATEMENT

CFA3 | Primrose Hill to Camden (Kilburn)

SV-02 - Operational Airborne Noise and Vibration Impacts and Likely Significant Effects
(with Assessment Locations)

SV-03 - Assessment and Monitoring Locations for Construction Sound, Noise & Vibration Assessments

SV-04 - Assessment and Monitoring Locations for Operational Sound, Noise & Vibration Assessments



Map Series Information:

SV-02 presents the direct operational noise impacts and likely significant effects of the Proposed Scheme.

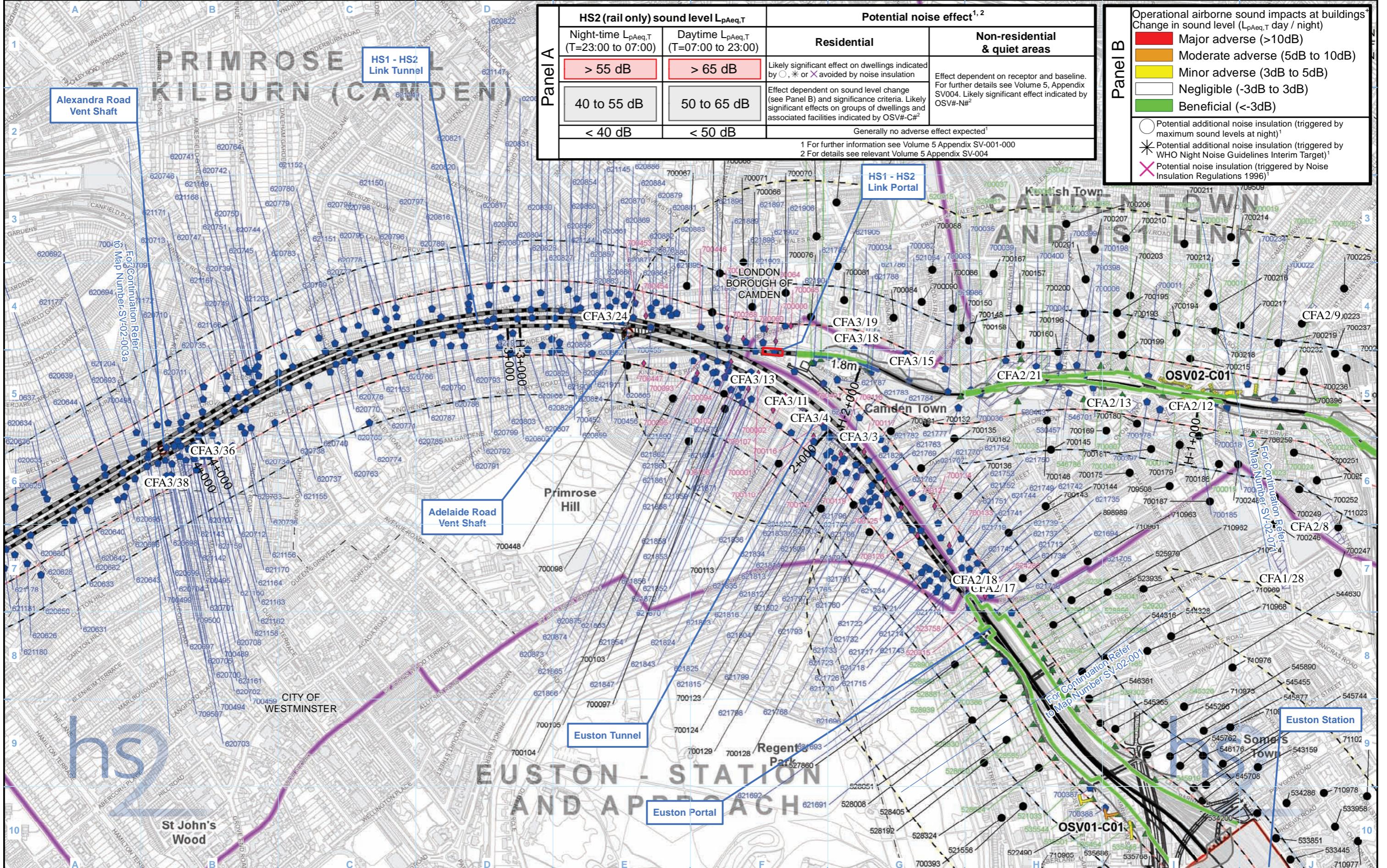
The SV-02 figure series necessarily contains a large amount of information relating to the operational noise and vibration assessment. It is designed to communicate visually the assessment process from the prediction of impacts to the determination of likely residual significant effects. The corresponding text is included in Vol2 and Vol5.

Key items on the map include the following:

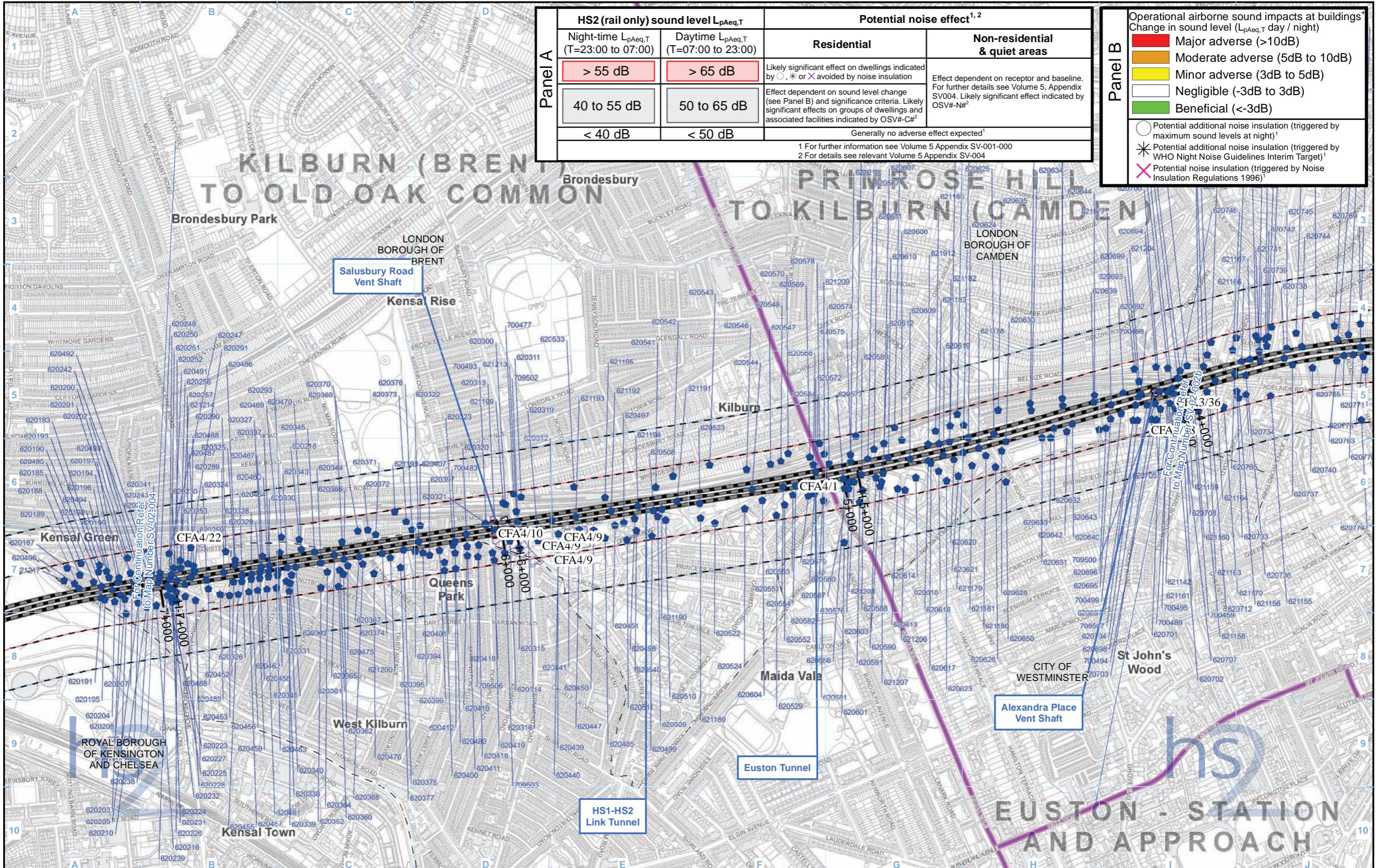
- The Proposed Scheme (the proposed railway alignments and surrounding associated earthworks/roads);
- blue and green lines representing the wayside airborne noise mitigation measures included in the Proposed Scheme;
- the study areas, which indicate the areas within which direct sound and vibration impacts of the scheme have been quantitatively assessed;
- the calculated direct operational impacts of the scheme, displayed as colour-coded buildings and symbols representing buildings that would potentially qualify for noise insulation;
- sound contours representing sound produced by the new railway (displayed in a simpler manner than on SV-01 in order not to obscure other features on the map series);
- the assessment locations at which a quantitative prediction of sound and impacts have been carried out (representing a number of nearby buildings). These are labelled with a unique reference number to enable cross-reference to further detail regarding the assessments in Volume 5: Appendix SV-004; and
- labels indicating where the likely residual direct noise or vibration significant effects have been identified. These are labelled with a unique reference number to enable cross-reference to further detail regarding the assessments in Volume 5: Appendix SV-004.

A more detailed explanation of each legend item included on the figures can be found in the data dictionary.

Note: Not all data layers in the legend are represented on every map.



Legend - General features		Legend - Sound related features		Map Number SV-02-002b		hs	
Route in bored tunnel	Engineering earthworks: Non engineering earthworks:	Committed developments (labelled as CFA##)	Airborne sound assessment location	Map Name	Operational Noise and Vibration Impacts and Likely Significant Effects (with Assessment Locations)	hs	HS2 Ltd accept no responsibility for any circumstances, which arise from the reproduction of this map after alteration, amendment or abbreviation or if it is issued in part or issued incomplete in any way.
Route in green tunnel	Embankment	Ground-borne sound & vibration study area (highly sensitive non-residential)	Airborne sound and vibration assessment location	Map Name	Community Forum Area CFA03: Primrose Hill to Kilburn (Camden)	hs	Registered in England. Registration number 06791686. Registered office: Eland House, Bressenden Place, London SW1E 5DU.
Route on surface	Cutting	Landscaping and/or fence barriers*	Ground-borne sound and/or vibration assessment location	Map Name	Community Forum Area CFA03: Primrose Hill to Kilburn (Camden)	hs	© Crown copyright and database rights 2013. Ordnance Survey Licence Number 100049190.
Depot, station, headhouse or portal building	Embankment	Envisaged mitigation to avoid / reduce significant noise effects:	Other environmental features e.g. landscaping	Map Name	Community Forum Area CFA03: Primrose Hill to Kilburn (Camden)	hs	Scale at A3: 1:10,000
Community forum boundary	Cutting	Envisaged measures further reducing noise effects:	Engineering e.g. cuttings	Map Name	Community Forum Area CFA03: Primrose Hill to Kilburn (Camden)	hs	0 100 200 300 400 Metres
District/Borough boundary	Embankment	• Other environmental features e.g. landscaping	Engineering e.g. cuttings	Map Name	Community Forum Area CFA03: Primrose Hill to Kilburn (Camden)	hs	Date: 29/10/13
County boundary	Cutting	* Residential buildings only	• Engineering e.g. cuttings	Map Name	Community Forum Area CFA03: Primrose Hill to Kilburn (Camden)	hs	
		* Labelled with total barrier height above rail level	▪ Airborne sound study area	Map Name	Community Forum Area CFA03: Primrose Hill to Kilburn (Camden)	hs	



Legend - General features		Legend - Sound related features		Map Number		Map Name			
Route in bored tunnel		Committed developments (labelled as CFA##)		SV-02-003a		hs		HS2 Ltd accept no responsibility for any circumstances, which arise from the reproduction of this map after alteration, amendment or abbreviation or if it is issued in part or issued incomplete in any way.	
Route in green tunnel		Ground-borne sound & vibration study area (residential and non-residential)							
Route on surface		Ground-borne sound & vibration study area (highly sensitive non-residential)							
Depot, station, headhouse or portal building		● Airborne sound assessment location							
Community forum boundary		▲ Airborne sound and vibration assessment location							
District/Borough boundary	* Residential buildings only	◆ Ground-borne sound and/or vibration assessment location							
County boundary	* Labelled with total barrier height above rail level	◆ Other environmental features e.g. landscaping							
		■ Engineering e.g. cuttings (green tunnels separately marked)							
		■ Envisaged measures further reducing noise effects:							
		■ Envisaged mitigation to avoid / reduce significant noise effects:							
		■ Landscaping and/or fence barriers*							
		■ Engineering e.g. cuttings							
		■ Airborne sound, ground-borne sound and vibration assessment location							
		■ Airborne sound study area							

Engineering earthworks: Non engineering earthworks: Embankment Embankment Cutting Cutting

Envisaged measures further reducing noise effects:
■ Engineering e.g. cuttings (green tunnels separately marked)

Envisaged mitigation to avoid / reduce significant noise effects:
■ Landscaping and/or fence barriers*

Other environmental features e.g. landscaping

Ground-borne sound & vibration study area (residential and non-residential)

Ground-borne sound & vibration study area (highly sensitive non-residential)

Airborne sound assessment location

Airborne sound and vibration assessment location

Ground-borne sound and/or vibration assessment location

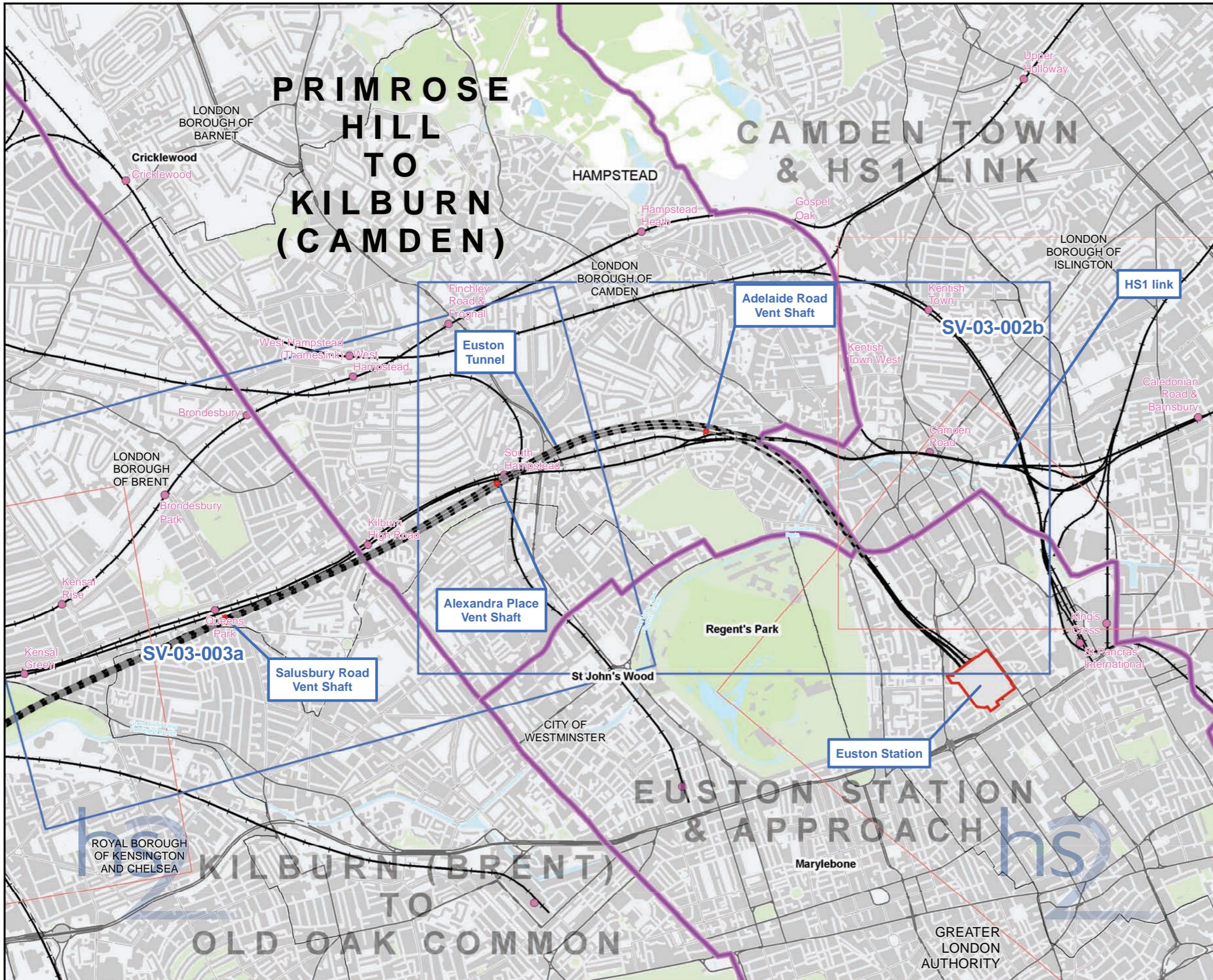
Airborne sound, ground-borne sound and vibration assessment location

Minor ground-borne noise or vibration impact*

Map Number: SV-02-003a
Map Name: Operational Noise and Vibration Impacts and Likely Significant Effects (with Assessment Locations)
Community Forum Area CFA03: Primrose Hill to Kilburn (Camden)
Doc Number: C250-ARP-EV-MAP-000-003654
Date: 29/10/13
Scale at A3: 1:10,000
0 100 200 300 400 Metres
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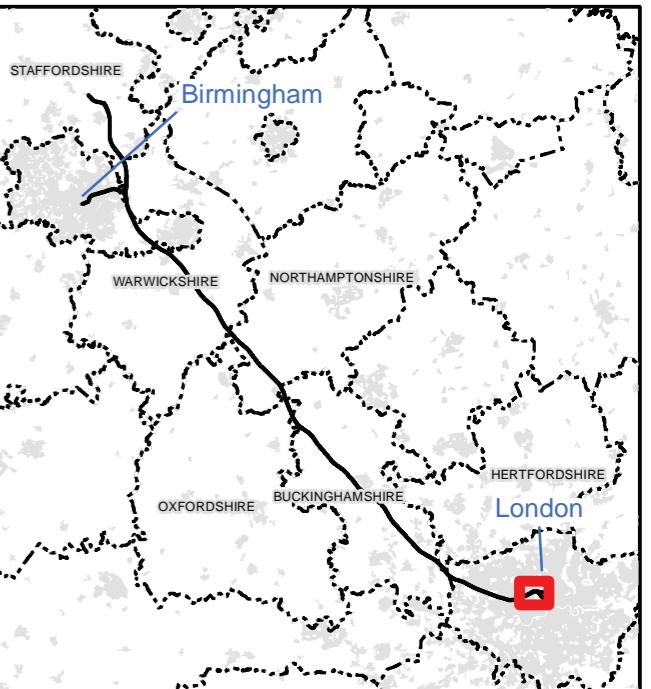


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Main Map Legend	
Route in tunnel	Map sheets included
Route on surface	Map sheets not included
Depot, station, headhouse or portal building	in this community forum
Community forum boundary	in this community forum
Existing railway station	
County boundary	
District/Borough boundary	

Map Number	SV-03-INDEX-CFA3
Map Name	Index Map of: Assessment and Monitoring Locations for Construction Sound, Noise & Vibration Assessments
Community Forum Area CFA3: Primrose Hill to Kilburn (Camden)	



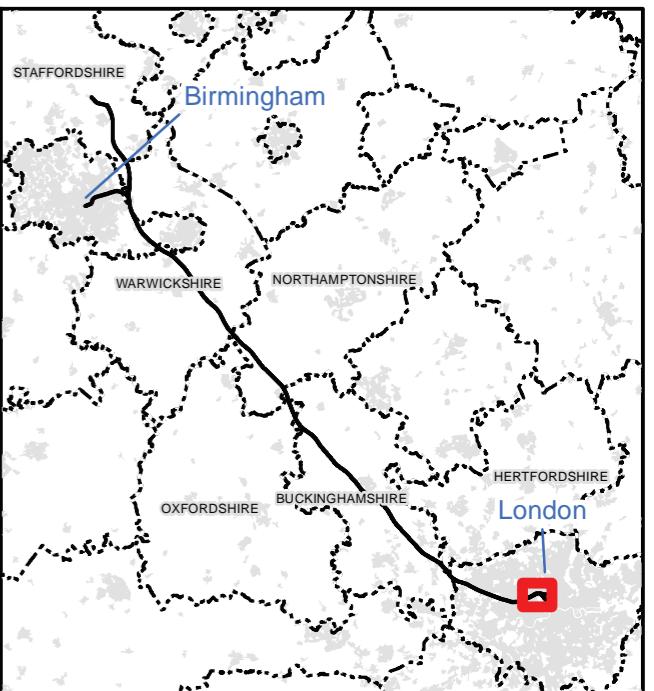
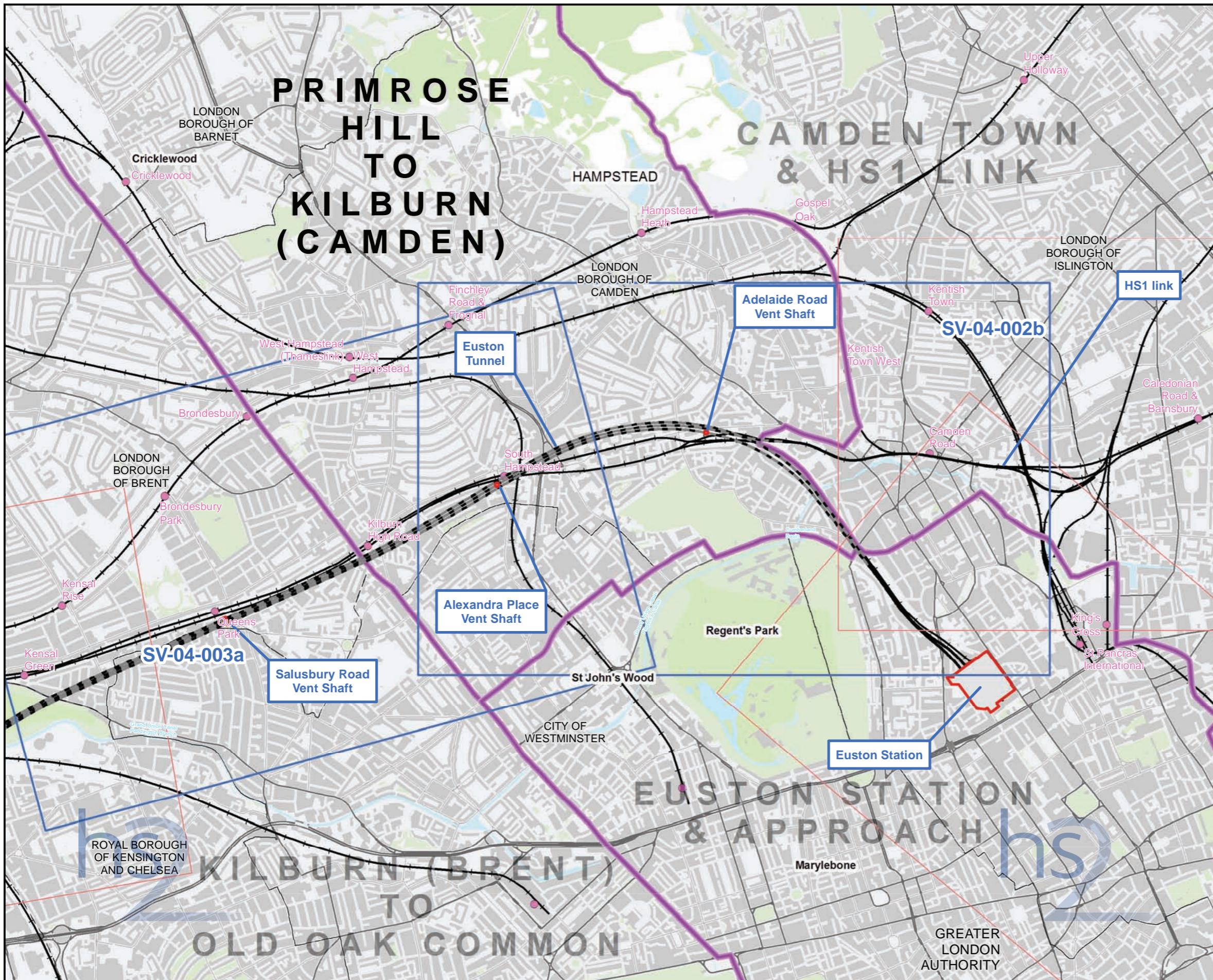
Map Series Information:

The SV-03 figure series accompanies the construction noise & vibration assessments. It shows the locations at which a quantitative assessment of the direct effects of construction noise and/or vibration has been carried out. These are labelled as assessment locations with a reference number to enable cross-reference to the construction noise and vibration reports contained in Volume 5: Appendix SV-003 and Volume 5: Appendix SV-002.

The figure series also shows locations at which baseline sound measurements were carried out. These baseline measurement locations are labelled with a reference number to enable cross-reference to the baseline sound reports contained in Volume 5: Appendix SV-002.

A more detailed explanation of each legend item included on the figures can be found in the data dictionary.

Note: Not all data layers in the legend are represented on every map.



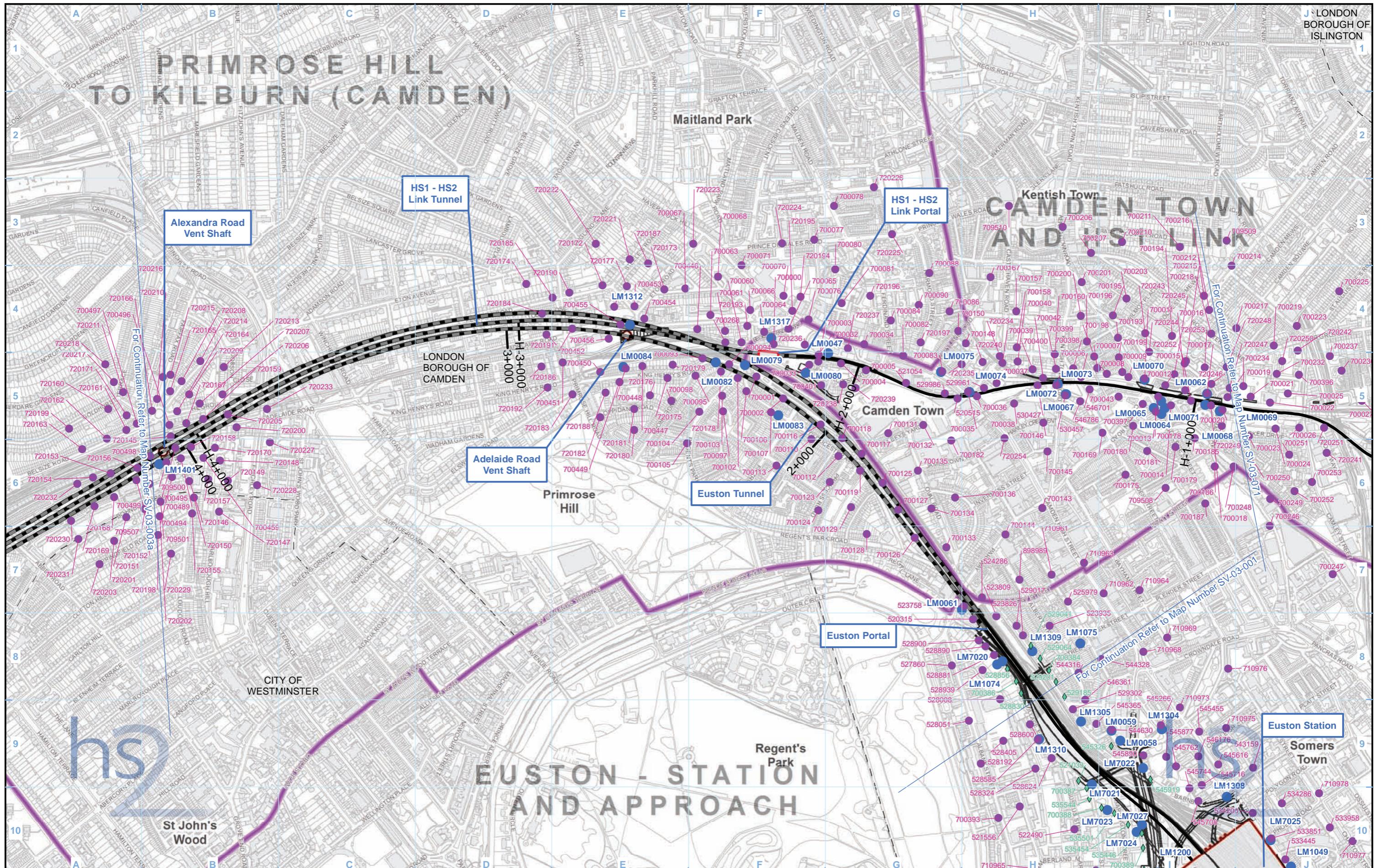
Map Series Information:

The SV-04 figure series shows the locations at which a quantitative assessment of the direct effects of operational sound and/or vibration has been carried out. These are labelled as assessment locations with a reference number to enable cross-reference to the operational sound and vibration reports contained in Volume 5: Appendix SV-004 and Volume 5: Appendix SV-002.

The figure series also shows locations at which baseline sound measurements were carried out. These baseline measurement locations are labelled with a reference number to enable cross-reference to the baseline sound reports contained in Volume 5: Appendix SV-002.

A more detailed explanation of each legend item included on the figures can be found in the data dictionary.

Note: Not all data layers in the legend are represented on every map.



Legend - General features

- Route in bored tunnel
 - Route in green tunnel
 - Route on surface
 - Depot, station, headhouse or portal building
 - Community forum boundary
 - District/Borough boundary
 - County boundary

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- | Engineering earthworks: | Non engineering earthworks: |
|--|---|
|  Embankment |  Cutting |
|  Cutting |  Cutting |

Legend - Sound related features

- Construction airborne sound assessment location
 - ◆ Construction vibration assessment locations
 - ◆ Construction airborne sound and vibration assessment location
 - Baseline measurement locations

labelled with Assessment Location ID reference number
(for details of the assessment results see relevant Vol 5 App

(for details of the assessment results see relevant vol 5
SV-003)

(labelled with Measurement | location reference code)

Map Number

SV-03-00

ix

Map Name

Assessment and Monitoring Locations for Construction Sound, Noise & Vibration Assessments

Community Forum Area CFA03:
Primrose Hill to Kilburn (Camden)

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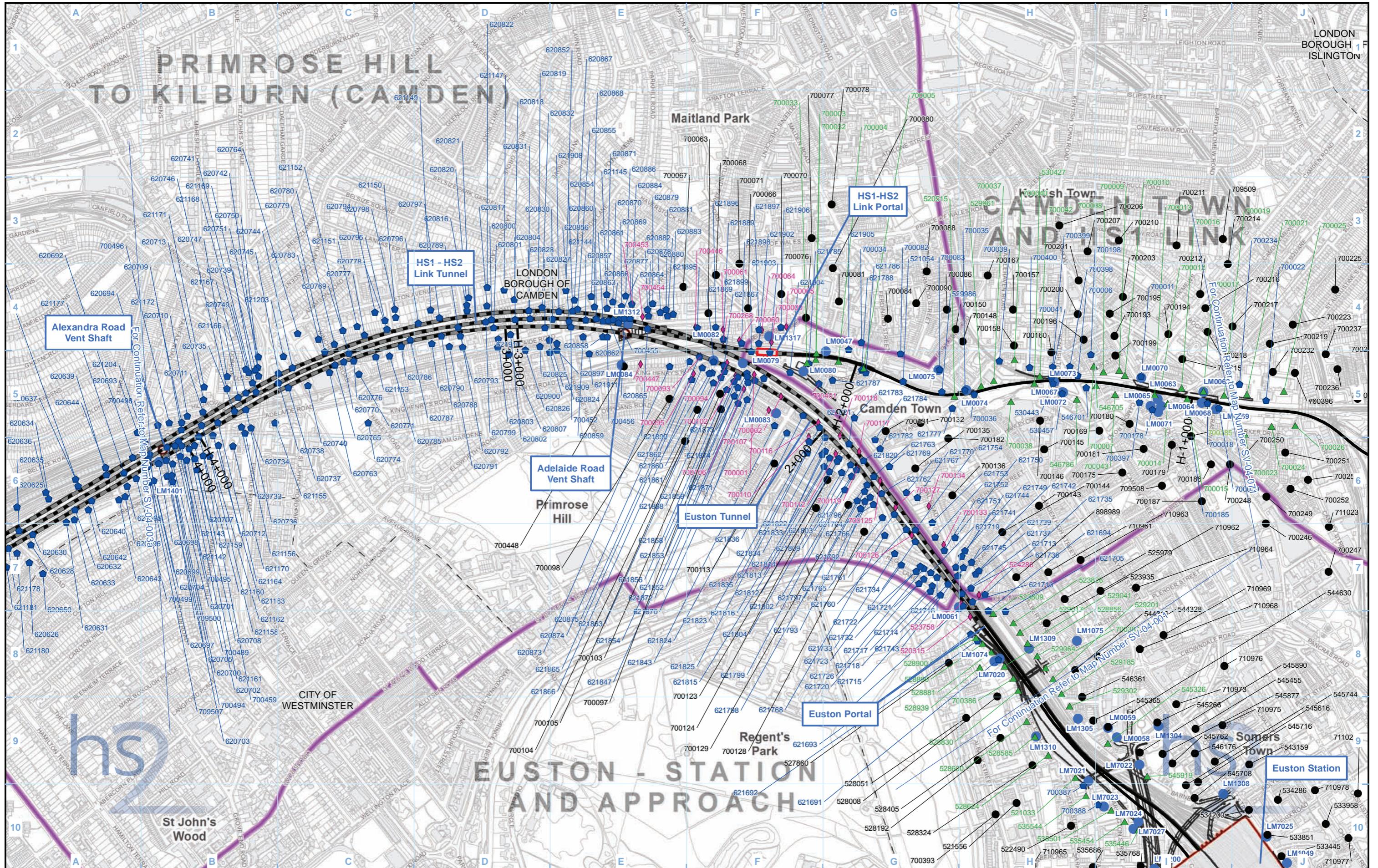


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Date: 29/10/13



Legend - General features

- Route in bored tunnel
 - Route in green tunnel
 - Route on surface
 - Depot, station, headhouse or portal building
 - Community forum boundary
 - District/Borough boundary
 - County boundary

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- | Engineering earthworks: | Non engineering earthworks: |
|-------------------------|-----------------------------|
| | |
| Embankment | Embankment |
| | |
| Cutting | Cutting |

Legend - Sound related features

- Airborne sound assessment location
 - ▲ Airborne sound and vibration assessment location
 - ◆ Ground-borne sound and/or vibration assessment location
 - ◆ Airborne sound, ground-borne sound and vibration assessment location
 - Baseline measurement locations

{ labelled with Assessment Location ID reference number
(for details of the assessment results see Vol 5 Appendix SV00

(labelled with Measurement Location reference code)

Map Number

SV-04-002b

Map Name

Assessment and Monitoring Locations for Operational Sound, Noise & Vibration Assessments

Community Forum Area CFA03
Primrose Hill to Kilburn (Camden)

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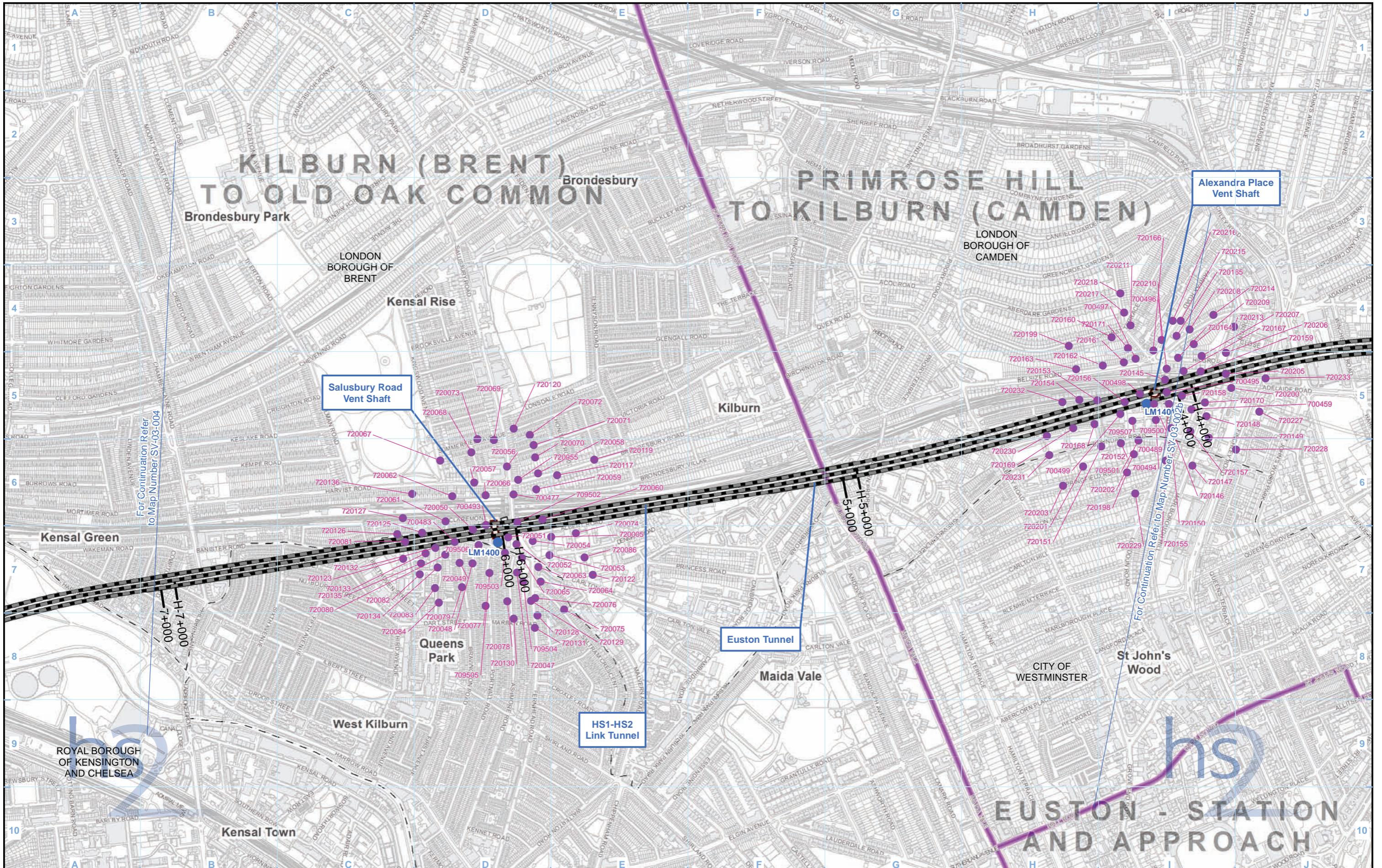
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London SW1E 5DU.

Scale at A3: 1:10 000



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Date: 29/10/13



Legend - General features

- Route in bored tunnel
- Route in green tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Community forum boundary
- District/Borough boundary
- County boundary

Engineering earthworks: Non engineering earthworks:

- Embankment
- Cutting

Legend - Sound related features

- Construction airborne sound assessment location
- Construction vibration assessment locations
- Construction airborne sound and vibration assessment location
- Baseline measurement locations

Map Number SV-03-003a
Map Name Assessment and Monitoring Locations for Construction Sound, Noise & Vibration Assessments
Community Forum Area CFA03: Primrose Hill to Kilburn (Camden)



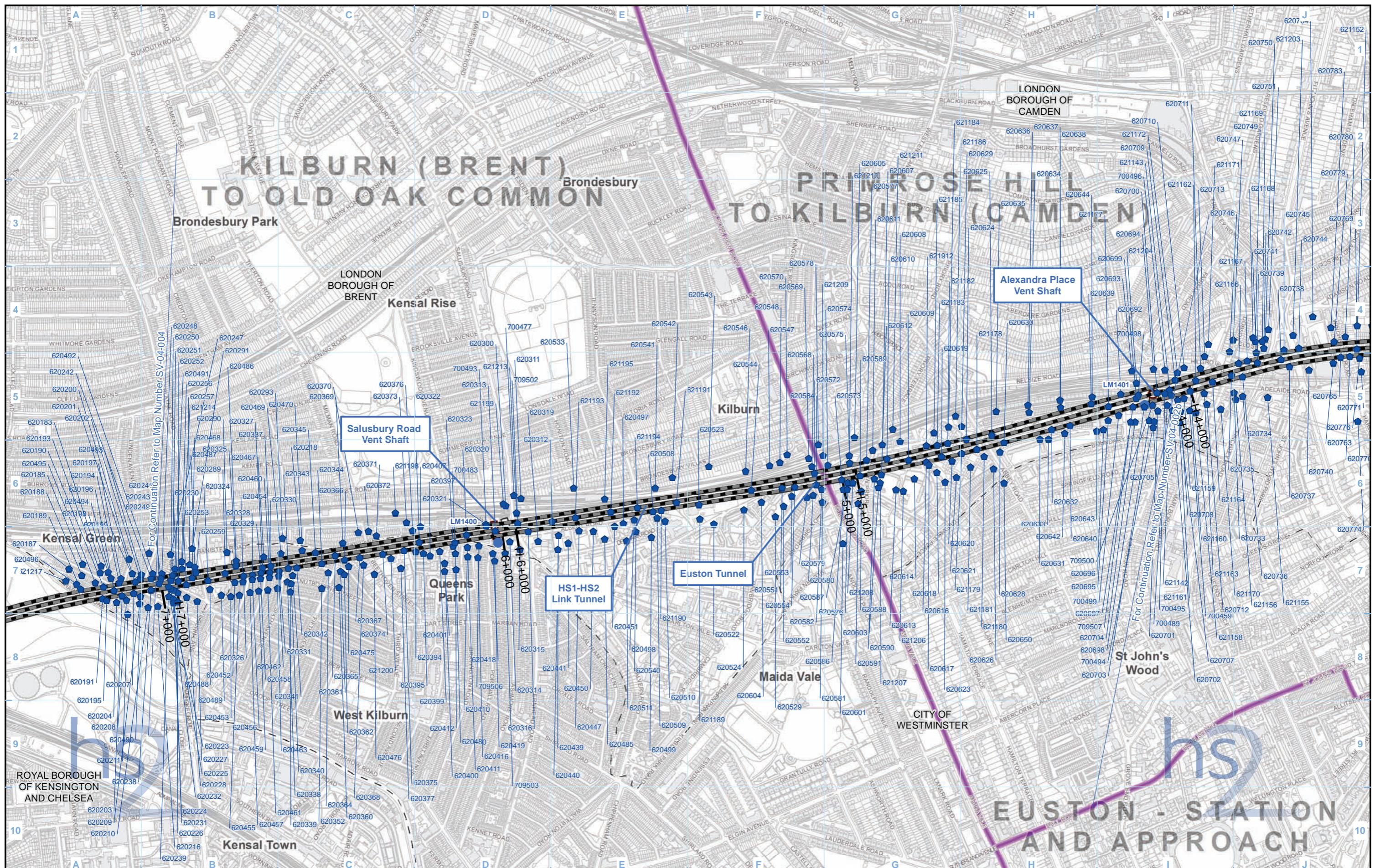
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Scale at A3: 1:10,000
Metres

Doc Number: C250-ARP-EV-MAP-000-003755

Date: 29/10/13



Legend - General features

- Route in bored tunnel
- Route in green tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Community forum boundary
- District/Borough boundary
- County boundary

- | | | |
|---|------------|------------|
| Engineering earthworks: Non engineering earthworks: | Embankment | Embankment |
| Embankment | Cutting | Cutting |

Legend - Sound related features

- Airborne sound assessment location
- ▲ Airborne sound and vibration assessment location
- ◆ Ground-borne sound and/or vibration assessment location
- ◆ Airborne sound, ground-borne sound and vibration assessment location
- Baseline measurement locations

labelled with Assessment Location ID reference number
(for details of the assessment results see Vol 5 Appendix SV004)

(labelled with Measurement Location reference code)

Map Number

SV-04-003a

Map Name

Assessment and Monitoring Locations for Operational Sound, Noise & Vibration Assessments

Community Forum Area CFA03:
Primrose Hill to Kilburn (Camden)



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LONDON-WEST MIDLANDS ENVIRONMENTAL STATEMENT

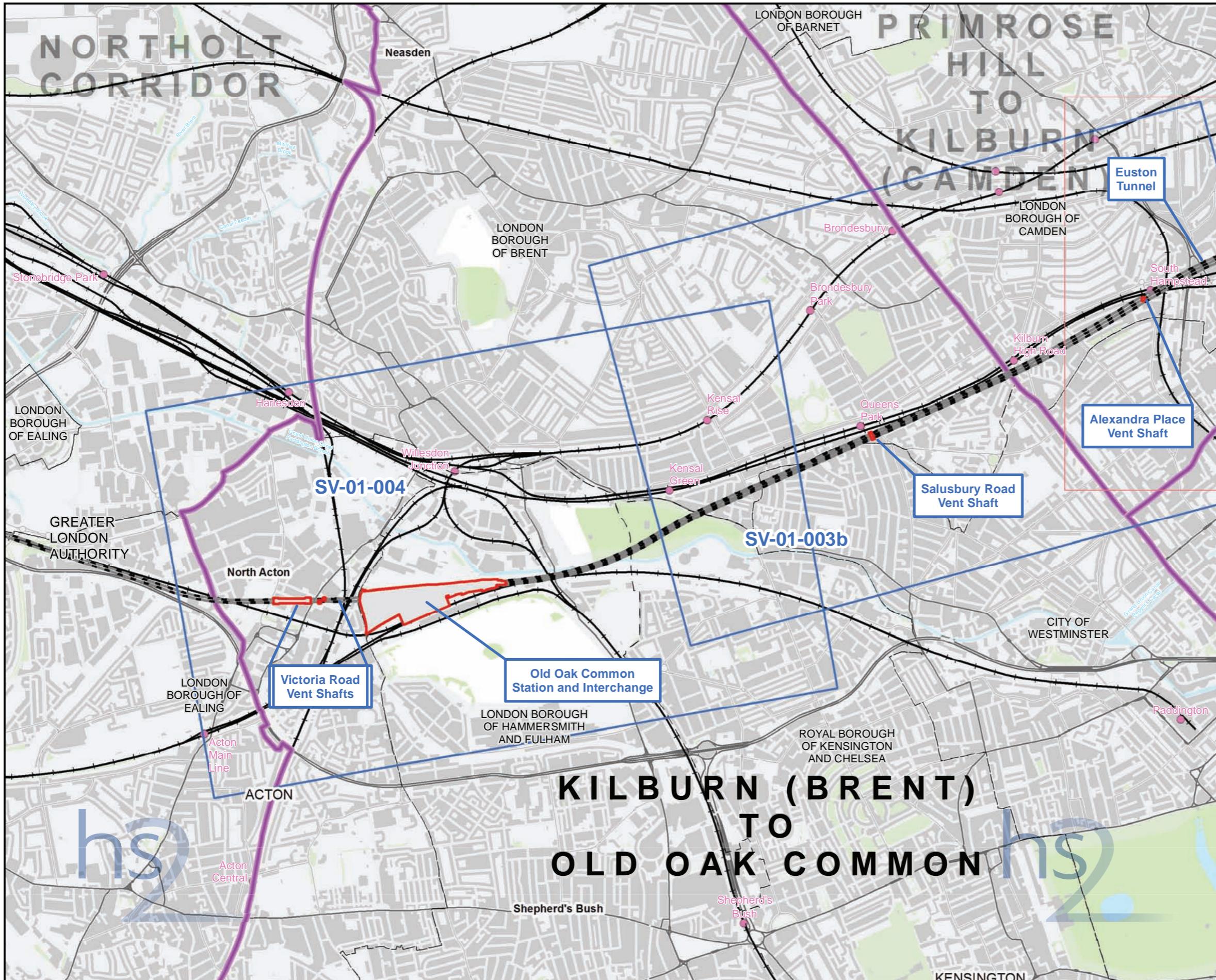
CFA4 | Kilburn (Brent) to Old Oak Common

SV-01 - Operational Sound Contour Maps and Likely Significant Effects

SV-02 - Operational Airborne Noise and Vibration Impacts and Likely Significant Effects
(with Assessment Locations)

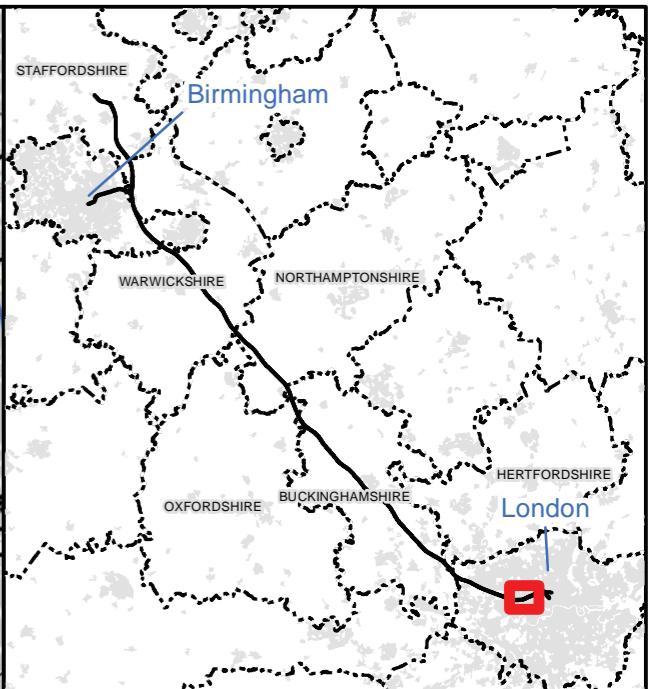
SV-03 - Assessment and Monitoring Locations for Construction Sound, Noise & Vibration Assessments

SV-04 - Assessment and Monitoring Locations for Operational Sound, Noise & Vibration Assessments



Main Map Legend	
Route in tunnel	Map sheets included
Route on surface	Map sheets not included
Depot, station, headhouse or portal building	in this community forum
Community forum boundary	in this community forum
Existing railway station	
County boundary	
District/Borough boundary	

Map Number	SV-01-INDEX-CFA4
Map Name	Index Map of: Operational Sound Contour Maps and Likely Significant Effects
Community Forum Area CFA4: Kilburn (Brent) to Old Oak Common	
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Map Series Information:

SV-01 presents the predicted operational sound from the new railway.

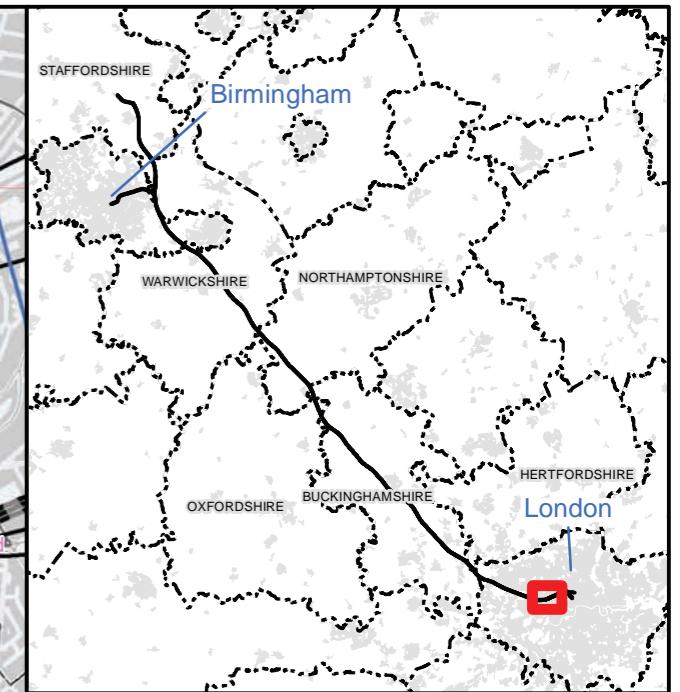
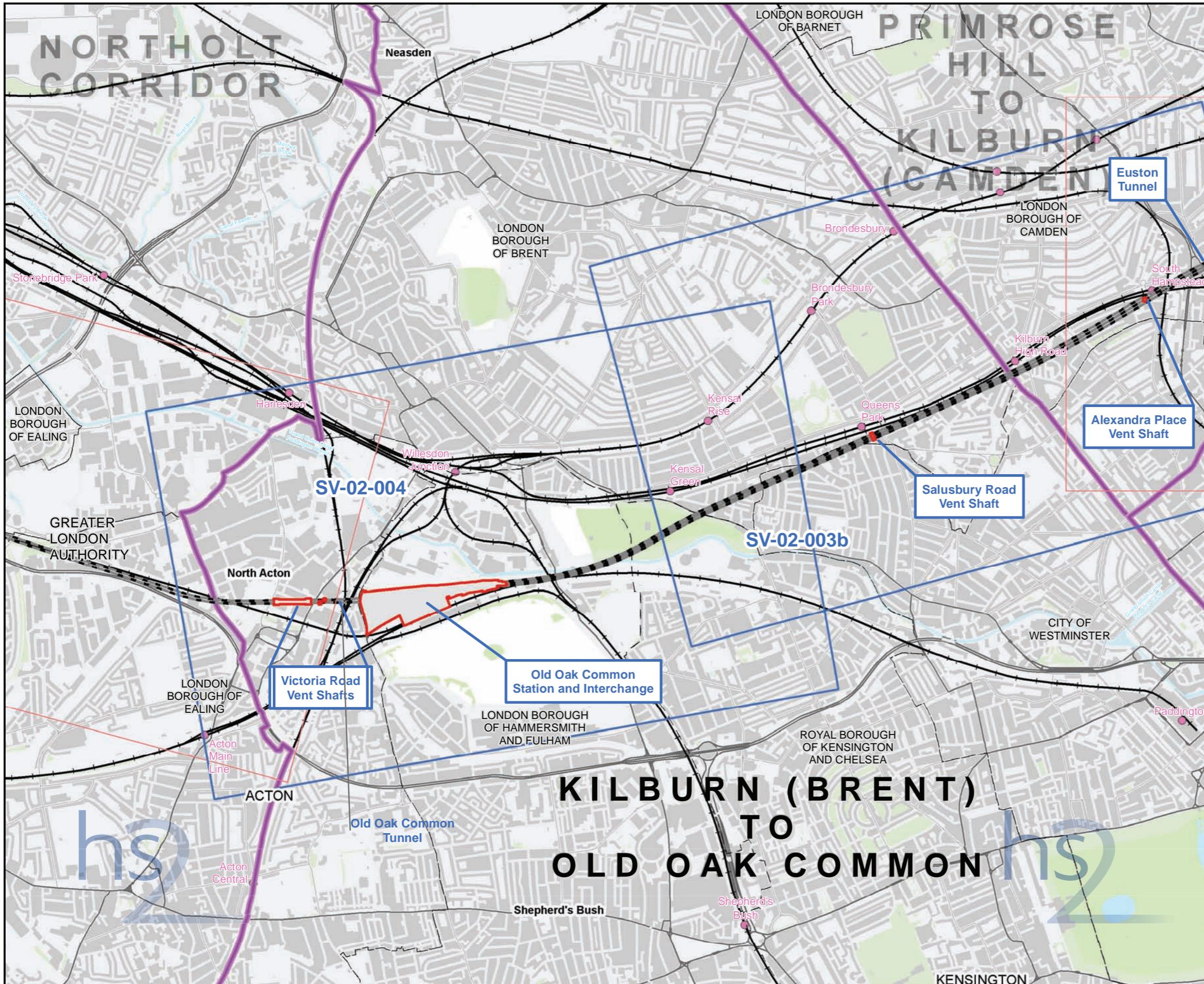
The sound levels from the new railway (expressed as $L_{PAeq,T}$) are presented in typical noise mapping colours in 5 dB steps. There is a panel at the top right of the figure; the left-hand section of this panel contains a key communicating the night-time and daytime sound levels represented by the various colours. The right-hand part of the same panel contains text explaining how the sound levels presented on the figure inform the assessment of direct noise impacts and likely significant effects. A corresponding and similar panel is found on SV-02, along with the key sound contours that were used within the environmental assessment.

Also presented on SV-01 are the following (which are also included on SV-02):

- A representation of the Proposed Scheme, including the railway alignment (indicating whether it is on the surface or in tunnel), any new and altered roads and all associated engineering and environmental mitigation earthworks;
- blue and green lines representing the wayside airborne noise mitigation measures included in the Proposed Scheme;
- symbols representing buildings that would potentially qualify for noise insulation;
- labels identifying the residual likely significant noise effects of the Proposed Scheme, and
- the extent of the study area within which the direct impacts and effects of the scheme have been quantitatively assessed.

A more detailed explanation of each legend item included on the figures can be found in the data dictionary.

Note: Not all data layers in the legend are represented on every map.



Map Series Information:

SV-02 presents the direct operational noise impacts and likely significant effects of the Proposed Scheme.

The SV-02 figure series necessarily contains a large amount of information relating to the operational noise and vibration assessment. It is designed to communicate visually the assessment process from the prediction of impacts to the determination of likely residual significant effects. The corresponding text is included in Vol2 and Vol5.

Key items on the map include the following:

- The Proposed Scheme (the proposed railway alignments and surrounding associated earthworks/roads);
- blue and green lines representing the wayside airborne noise mitigation measures included in the Proposed Scheme;
- the study areas, which indicate the areas within which direct sound and vibration impacts of the scheme have been quantitatively assessed;
- the calculated direct operational impacts of the scheme, displayed as colour-coded buildings and symbols representing buildings that would potentially qualify for noise insulation;
- sound contours representing sound produced by the new railway (displayed in a simpler manner than on SV-01 in order not to obscure other features on the map series);
- the assessment locations at which a quantitative prediction of sound and impacts have been carried out (representing a number of nearby buildings). These are labelled with a unique reference number to enable cross-reference to further detail regarding the assessments in Volume 5: Appendix SV-004; and
- labels indicating where the likely residual direct noise or vibration significant effects have been identified. These are labelled with a unique reference number to enable cross-reference to further detail regarding the assessments in Volume 5: Appendix SV-004.

A more detailed explanation of each legend item included on the figures can be found in the data dictionary.

Note: Not all data layers in the legend are represented on every map.

Map Number SV-02-INDEX-CFA4

Map Name
Index Map of:
Operational Noise and Vibration Impacts and Likely
Significant Effects (with Assessment Locations)

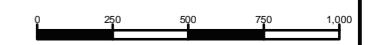
Community Forum Area CFA4:
Kilburn (Brent) to Old Oak Common

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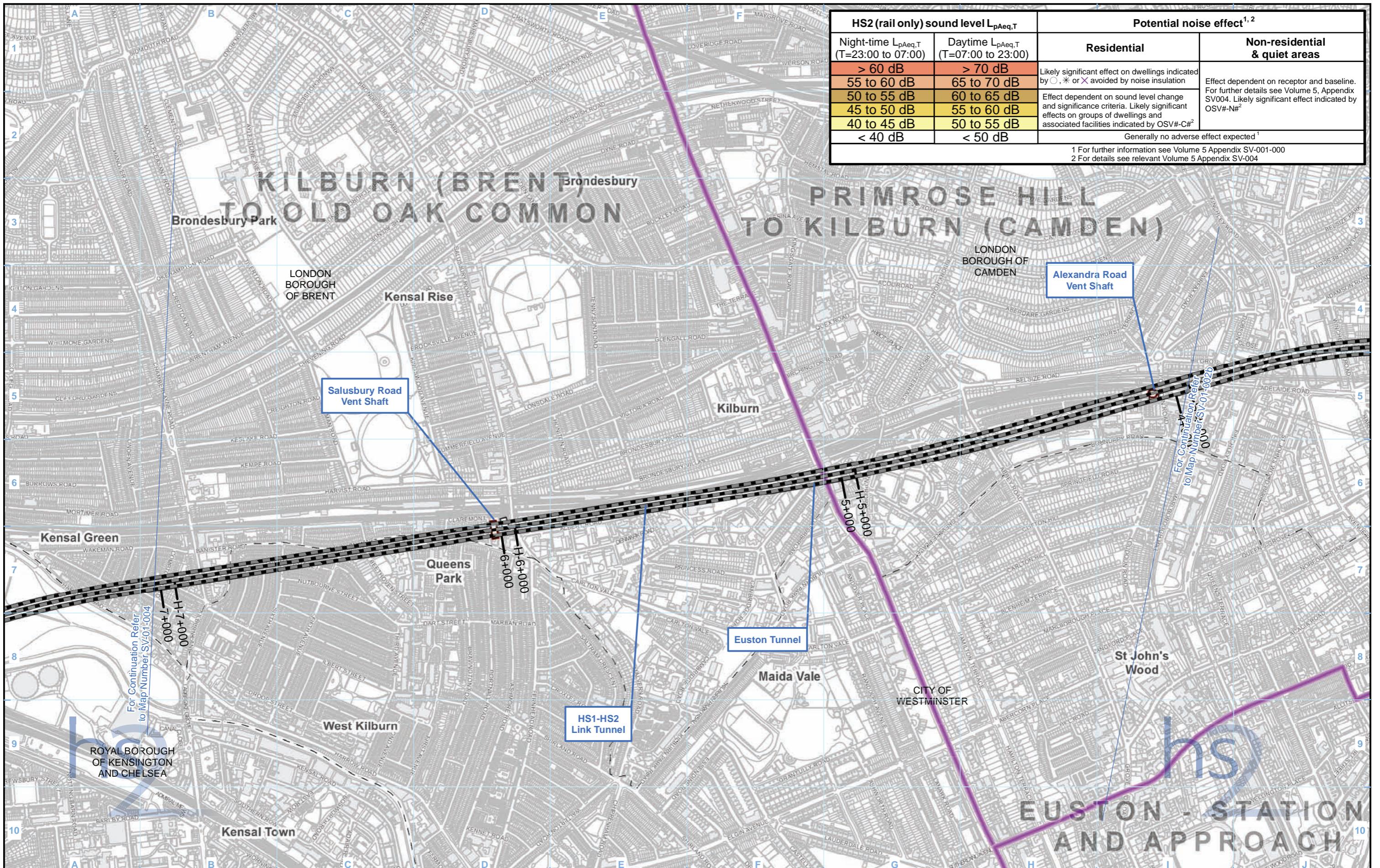
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Doc Number: C250-ARP-EV-MAP-000-004086--P04.00

Date: 29/10/13



Legend - General features		Legend - Sound related features		Map Number	Map Name	Community Forum Area CFA04: Kilburn (Brent) to Old Oak Common	hs2 Ltd accept no responsibility for any circumstances, which arise from the reproduction of this map after alteration, amendment or abbreviation or if it is issued in part or issued incomplete in any way.
Route in bored tunnel	Engineering earthworks:	Airborne sound study area	Potential additional noise insulation (triggered by maximum sound levels at night) ¹				
Route in green tunnel	Non engineering earthworks:	Envisaged mitigation to avoid / reduce significant noise effects:	○ Potential additional noise insulation (triggered by maximum sound levels at night) ¹				
Route on surface	Embankment	Landscaping and/or fence barriers*	○ Potential additional noise insulation (triggered by WHO Night Noise Guidelines Interim Target) ¹				
Depot, station, headhouse or portal building	Cutting	Engineering e.g. cuttings (green tunnels separately marked)	* Potential noise insulation (triggered by Noise Insulation Regulations 1996) ¹				
Community forum boundary		Envisaged measures further reducing noise effects:					
District/Borough boundary		■ Other environmental e.g. landscaping					
County boundary		■ Engineering e.g. cuttings					

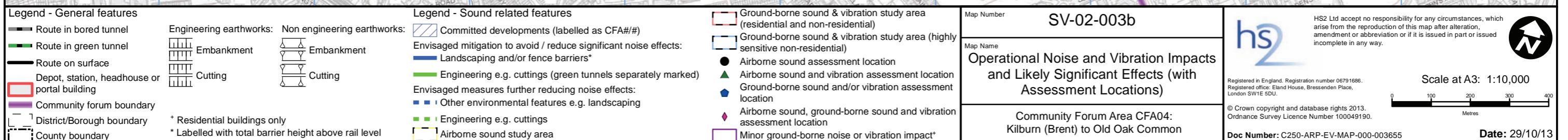
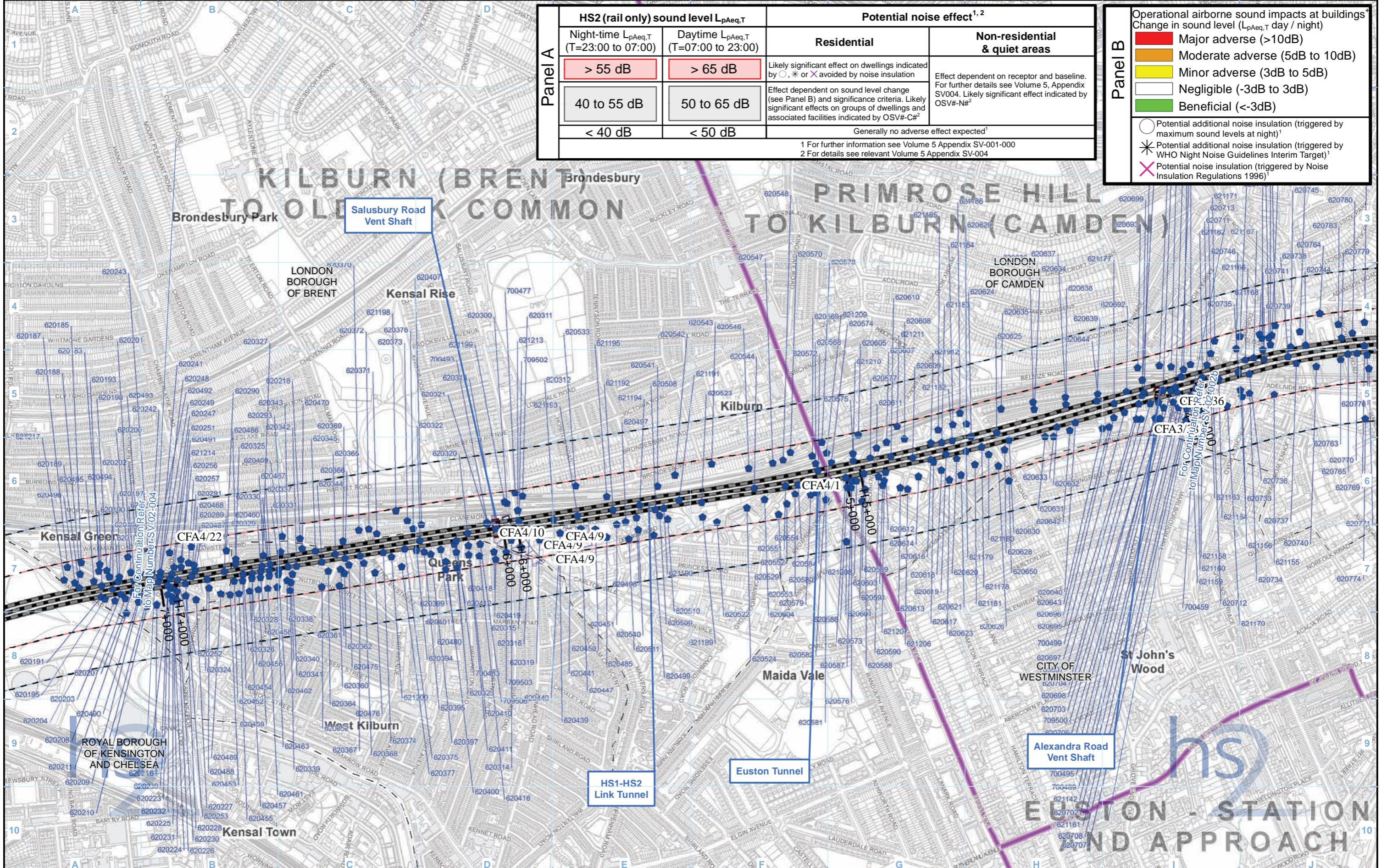
* Labelled with total barrier height above rail level

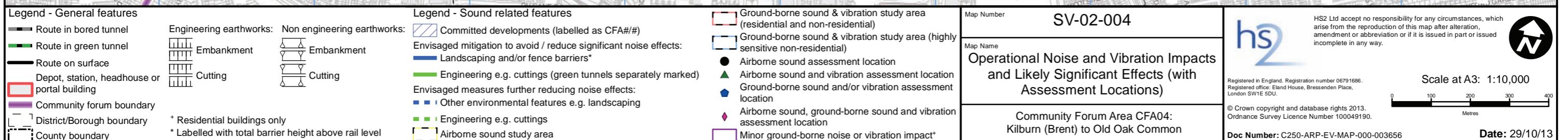
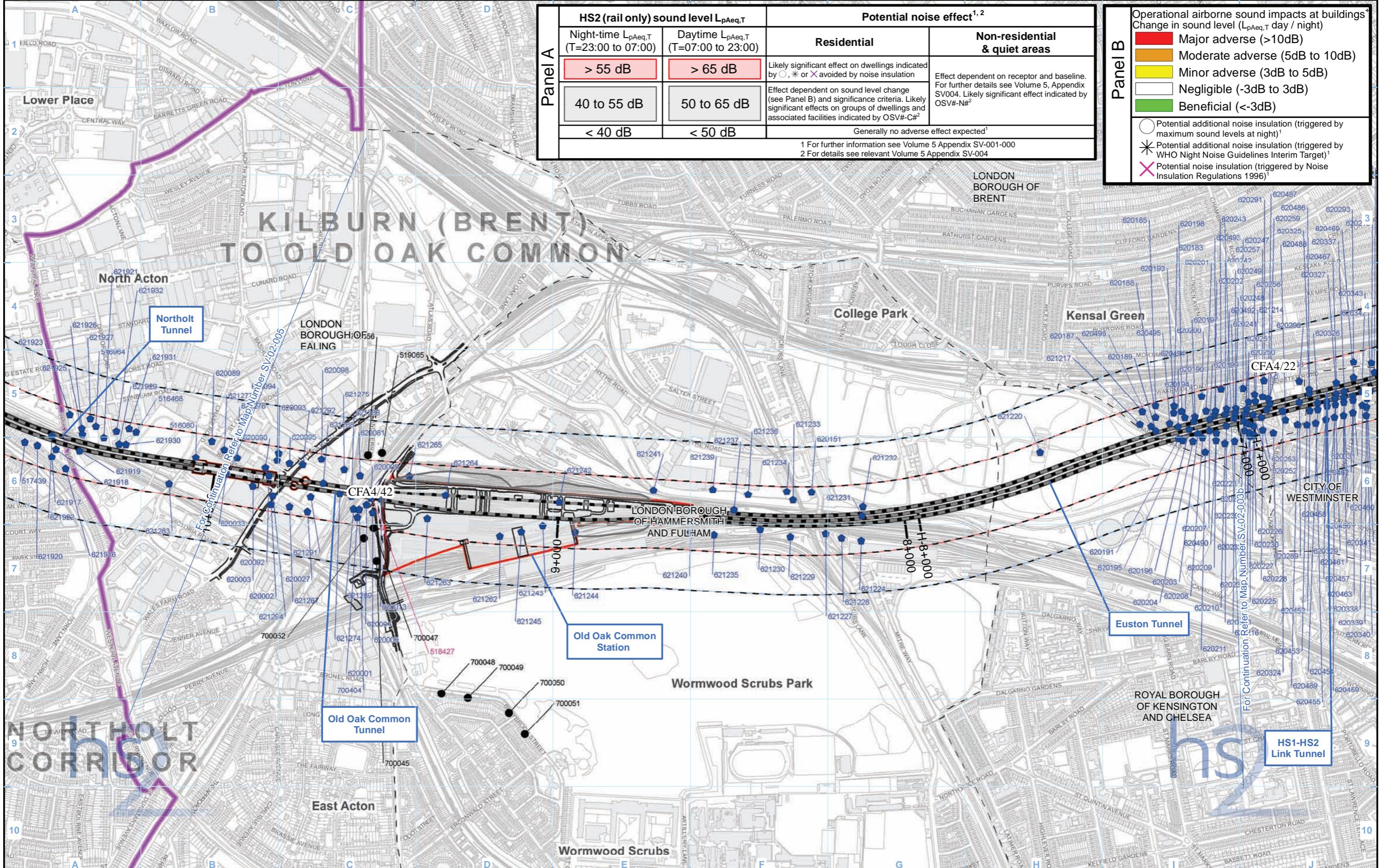
Map Number: SV-01-003b
Map Name: Operational Sound Contour Maps and Likely Significant Effects
Community Forum Area CFA04: Kilburn (Brent) to Old Oak Common

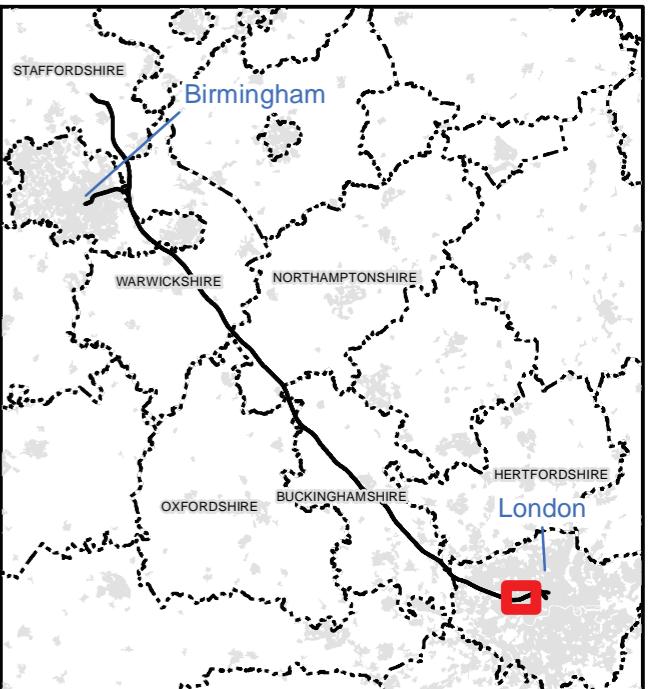
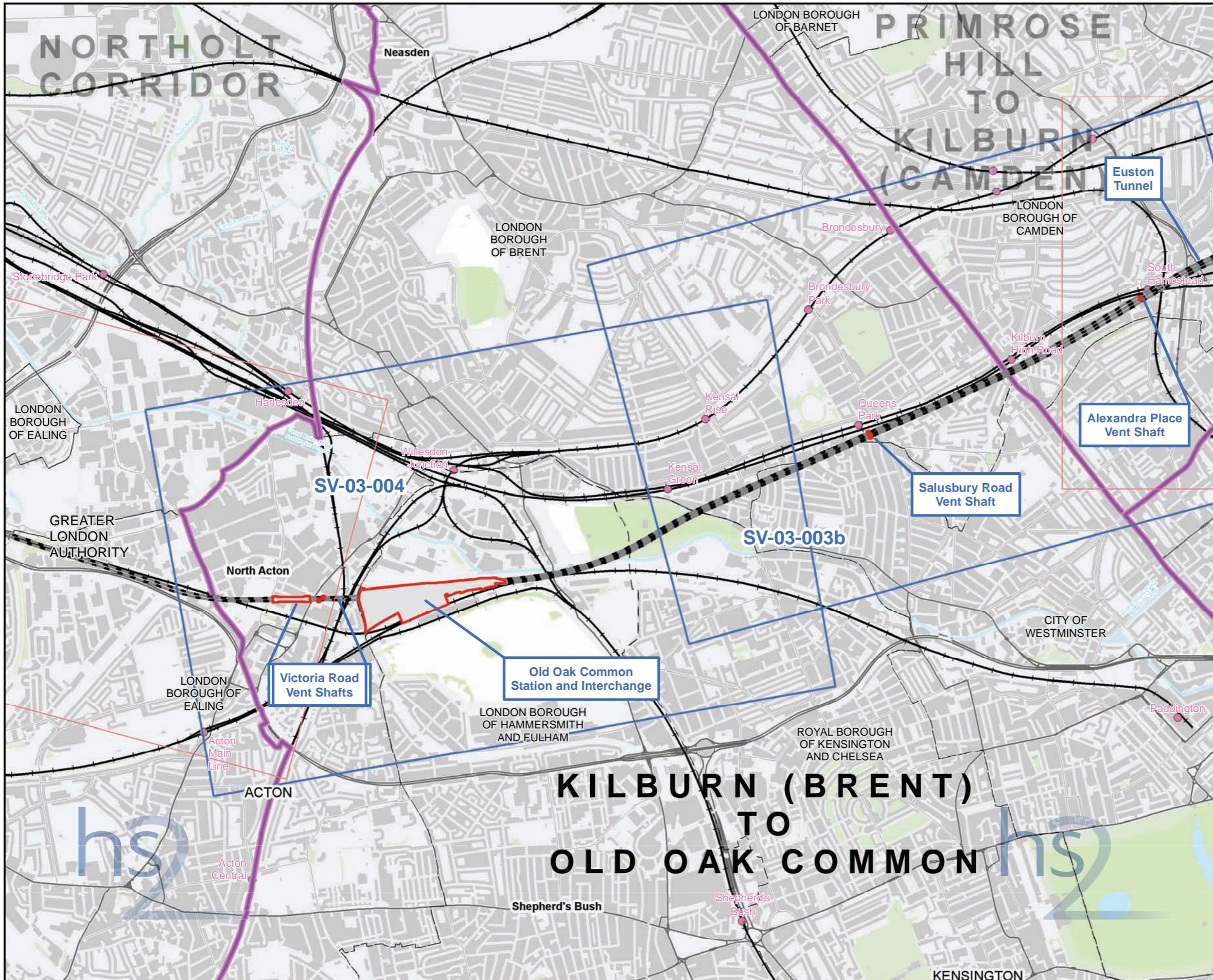
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Metres
0 100 200 300 400

Date: 29/10/13
Doc Number: C250-ARP-EV-MAP-000-003552







Map Series Information:

The SV-03 figure series accompanies the construction noise & vibration assessments. It shows the locations at which a quantitative assessment of the direct effects of construction noise and/or vibration has been carried out. These are labelled as assessment locations with a reference number to enable cross-reference to the construction noise and vibration reports contained in Volume 5: Appendix SV-003 and Volume 5: Appendix SV-002.

The figure series also shows locations at which baseline sound measurements were carried out. These baseline measurement locations are labelled with a reference number to enable cross-reference to the baseline sound reports contained in Volume 5: Appendix SV-002.

A more detailed explanation of each legend item included on the figures can be found in the data dictionary.

Note: Not all data layers in the legend are represented on every map.

Map Number: SV-03-INDEX-CFA4

Map Name: Index Map of:
Assessment and Monitoring Locations for
Construction Sound, Noise & Vibration Assessments

Community Forum Area CFA4:
Kilburn (Brent) to Old Oak Common

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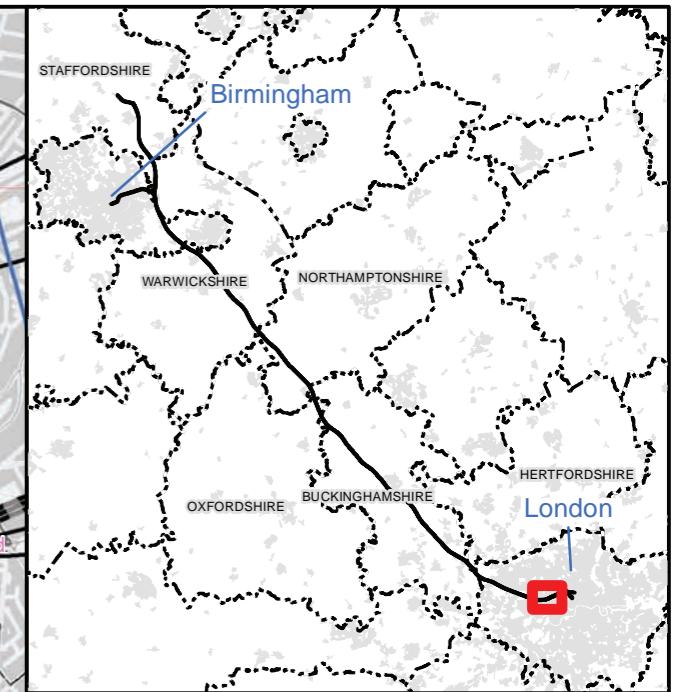
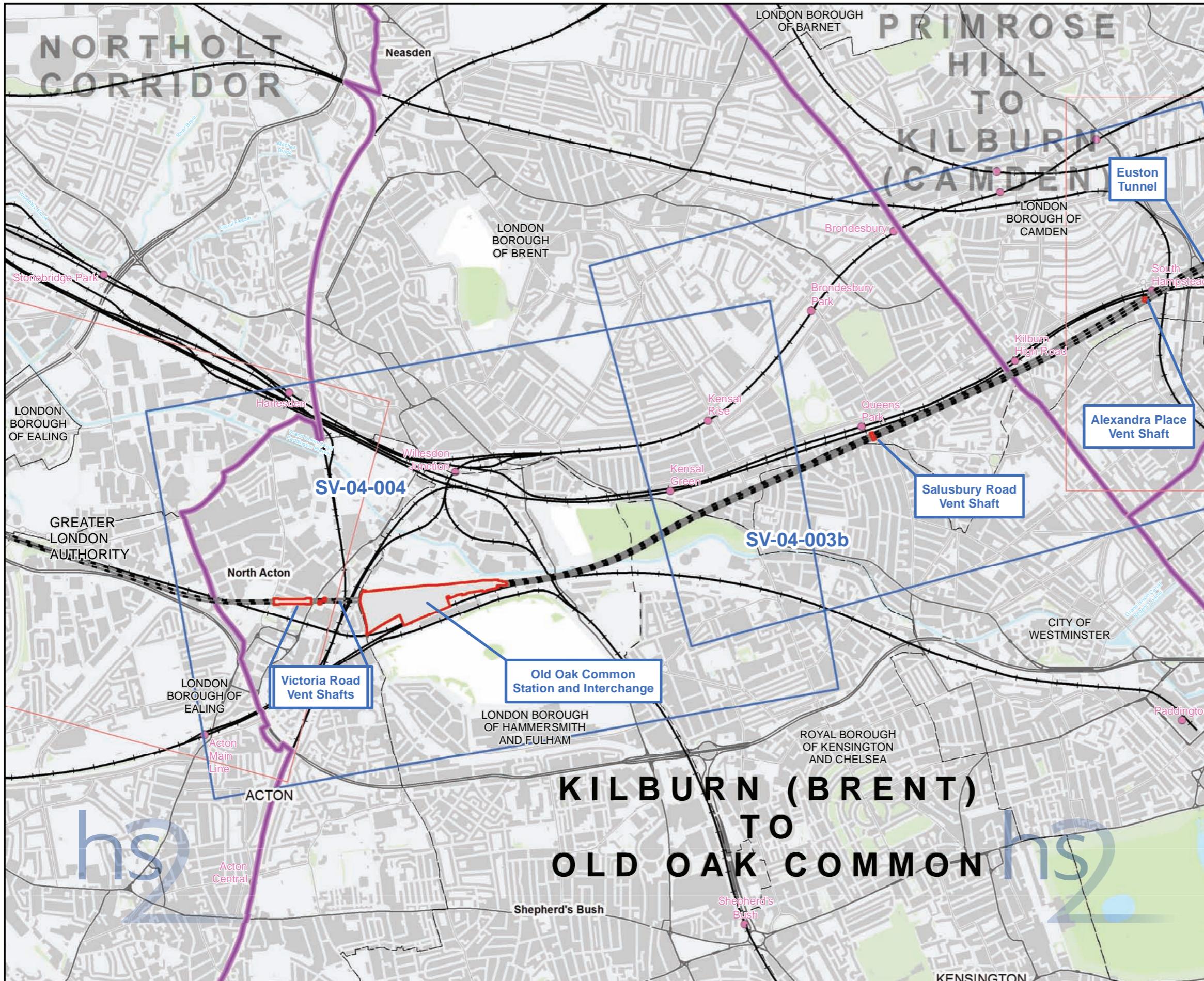
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Doc Number: C250-ARP-EV-MAP-000-004112-P06.00

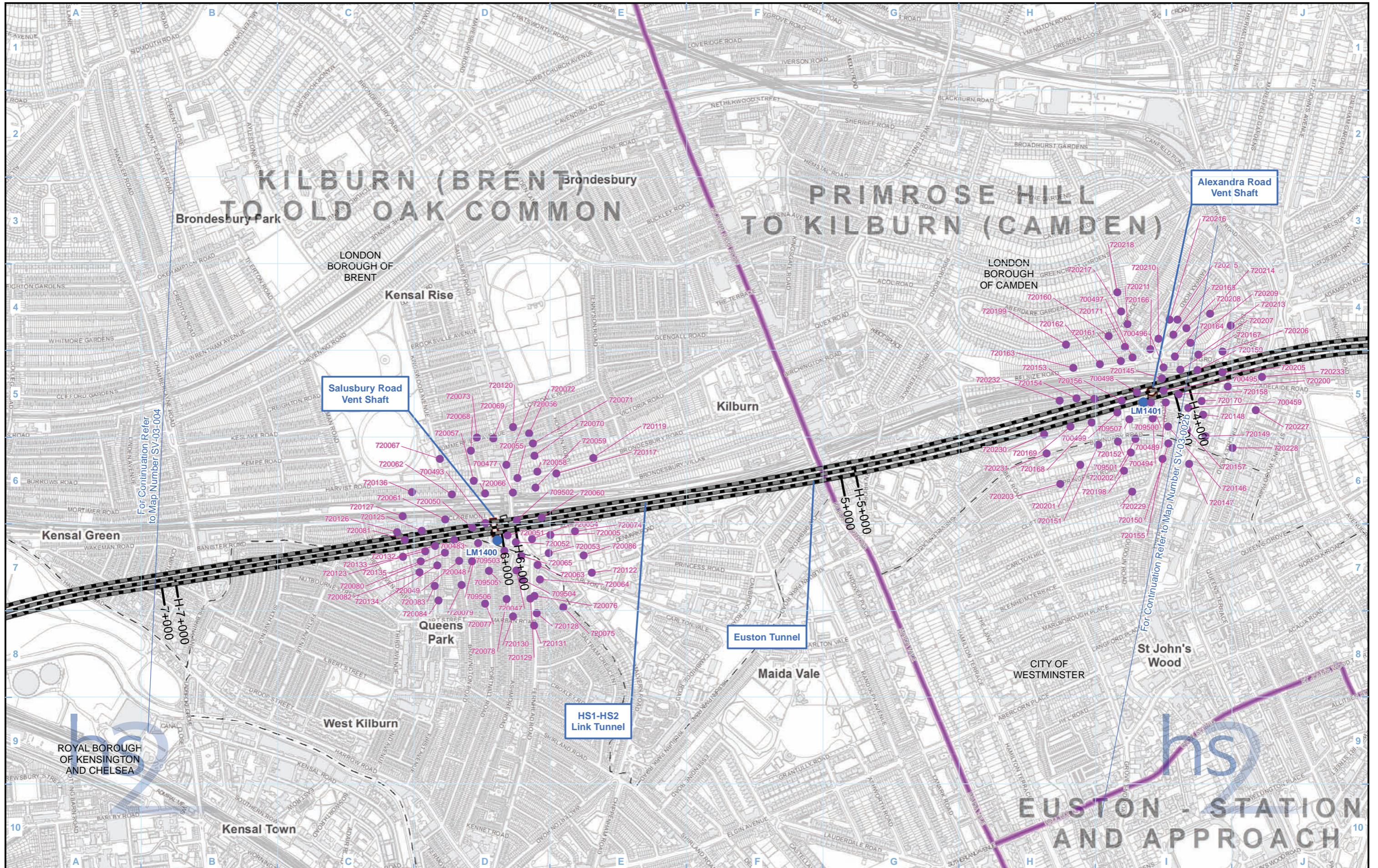


Date: 29/10/13



Main Map Legend	
Route in tunnel	Map sheets included
Route on surface	Map sheets not included
Depot, station, headhouse or portal building	in this community forum
Community forum boundary	in this community forum
Existing railway station	
County boundary	
District/Borough boundary	

Map Number	SV-04-INDEX-CFA4
Map Name	Index Map of: Assessment and Monitoring Locations for Operational Sound, Noise & Vibration Assessments
Community Forum Area CFA4: Kilburn (Brent) to Old Oak Common	
Scale at A3: 1:25,000	



Legend - General features

- Route in bored tunnel
 - Route in green tunnel
 - Route on surface
 - Depot, station, headhouse or portal building
 - Community forum boundary
 - District/Borough boundary
 - County boundary

Legend - Sound related features

- Construction airborne sound assessment location
 - Construction vibration assessment locations
 - ◆ Construction airborne sound and vibration assessment location
 - Baseline measurement locations

labelled with Assessment Location ID reference number
(for details of the assessment results see relevant Vol 5 Appendix)

SV-003)

1) [View](#) [Edit](#) [Delete](#) [Details](#)

(labelled with Measurement Location reference code)

Map Number

SV-03-003b

Map Name

Assessment and Monitoring Locations for Construction Sound, Noise & Vibration Assessments

Community Forum Area CFA04:
Kilburn (Brent) to Old Oak Common

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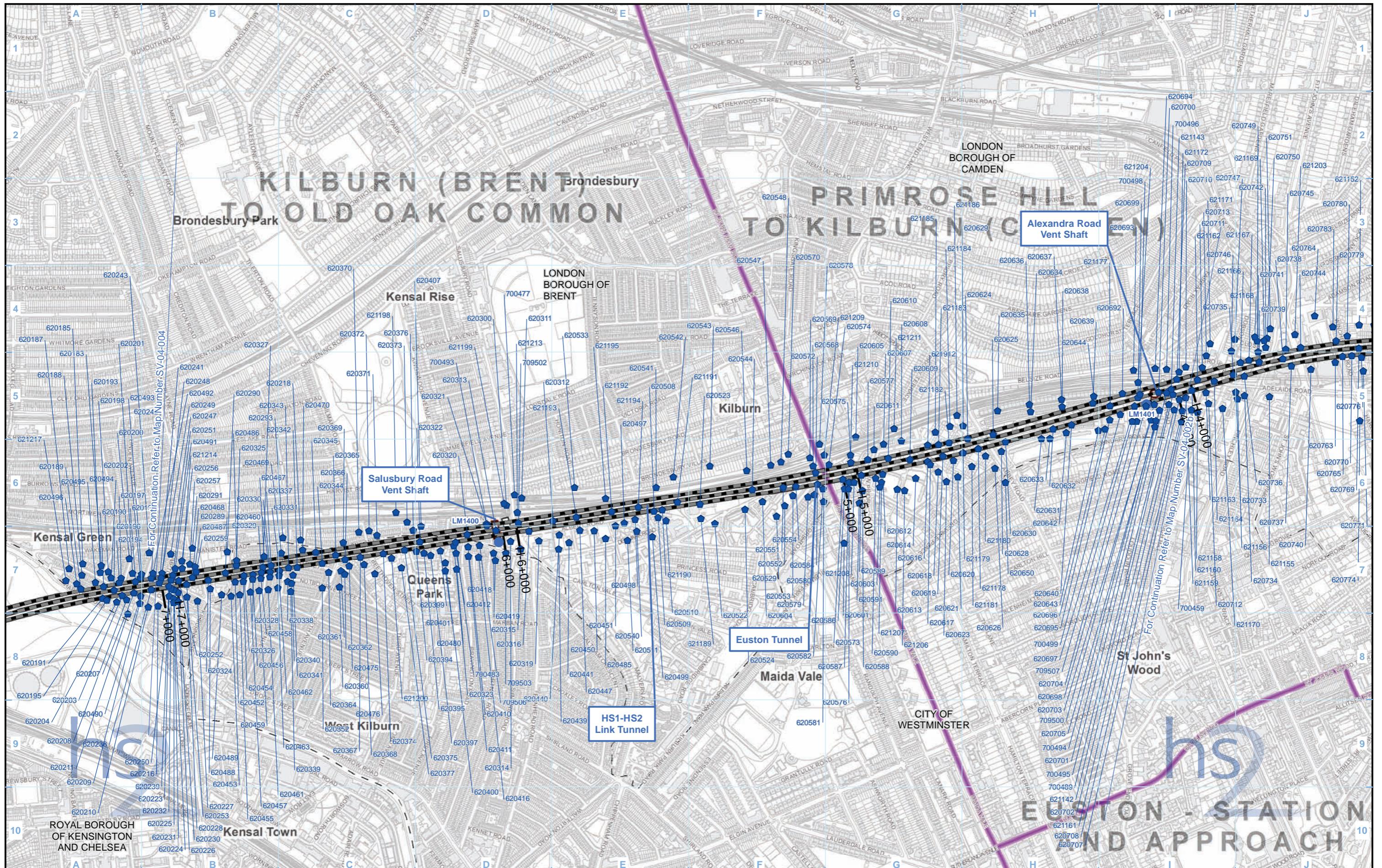


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A horizontal black line representing a DNA segment. Three vertical tick marks are placed along it, labeled '100' on the left, '200' in the middle, and '300' on the right. The segment between 100 and 200 is shaded white, while the segments before 100 and after 300 are black.

Date: 29/10/13


Legend - General features

- Route in bored tunnel
- Route in green tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Community forum boundary
- District/Borough boundary
- County boundary

- | | |
|-------------------------|-----------------------------|
| Engineering earthworks: | Non engineering earthworks: |
| | |
| Embankment | Embankment |
| | |
| Cutting | Cutting |

Legend - Sound related features

- Airborne sound assessment location
- ▲ Airborne sound and vibration assessment location
- ◆ Ground-borne sound and/or vibration assessment location
- ◆ Airborne sound, ground-borne sound and vibration assessment location
- Baseline measurement locations

labelled with Assessment Location ID reference number
(for details of the assessment results see Vol 5 Appendix SV004)
(labelled with Measurement Location reference code)

Map Number
SV-04-003b
Map Name
Assessment and Monitoring Locations for Operational Sound, Noise & Vibration Assessments

Community Forum Area CFA04:
Kilburn (Brent) to Old Oak Common


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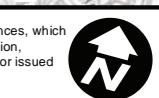
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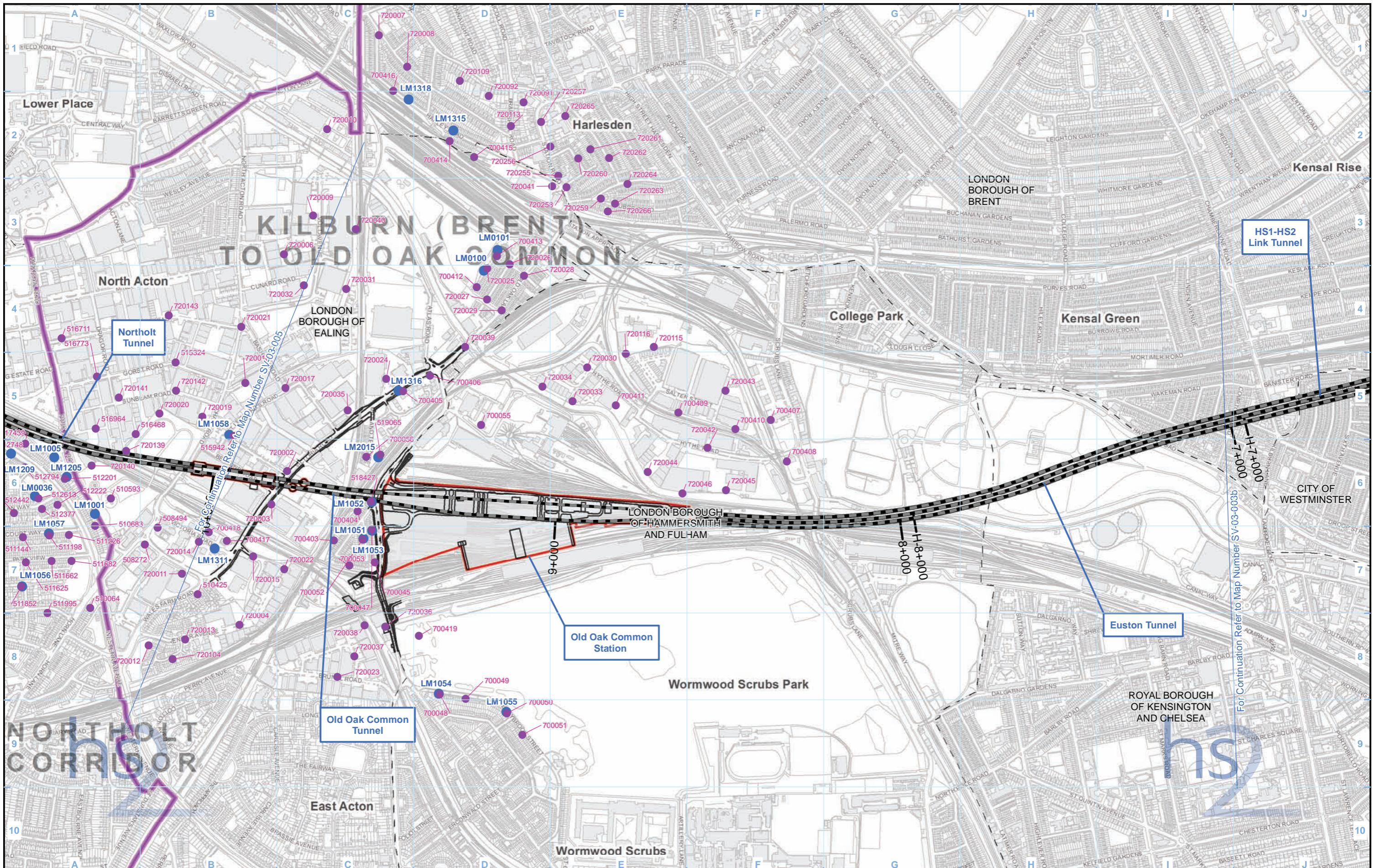
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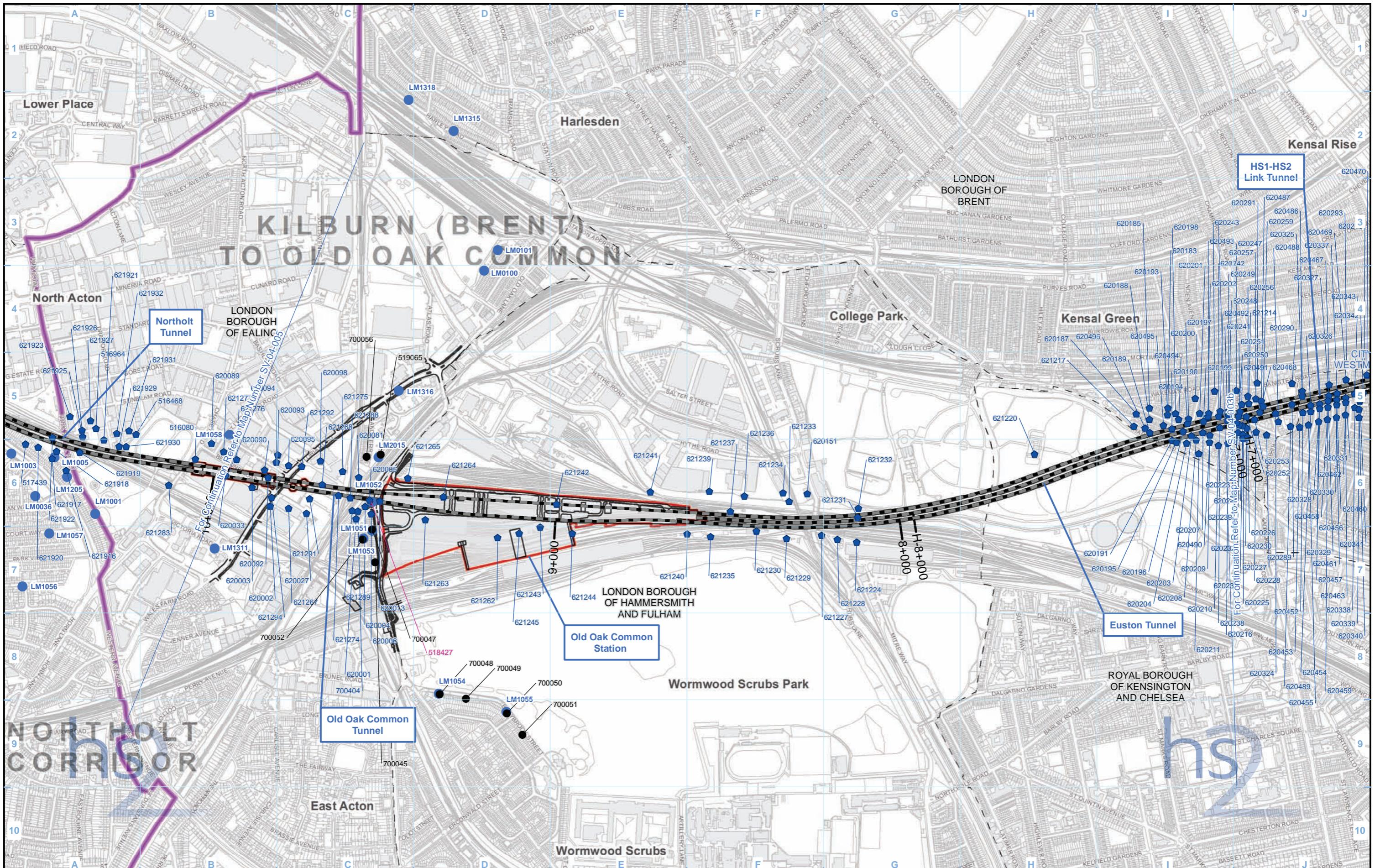
Scale at A3: 1:10,000

0 100 200 300 400 Metres



Date: 29/10/13




Legend - General features

- Route in bored tunnel
- Route in green tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Community forum boundary
- District/Borough boundary
- County boundary

- | | |
|-------------------------|-----------------------------|
| Engineering earthworks: | Non engineering earthworks: |
| | |
| | |
| | |
| | |
- Embankment Embankment
Cutting Cutting

Legend - Sound related features

- Airborne sound assessment location
- ▲ Airborne sound and vibration assessment location
- ◆ Ground-borne sound and/or vibration assessment location
- ◆ Airborne sound, ground-borne sound and vibration assessment location
- Baseline measurement locations

labelled with Assessment Location ID reference number
(for details of the assessment results see Vol 5 Appendix SV004)

(labelled with Measurement Location reference code)

Map Number
SV-04-004
Map Name

**Assessment and Monitoring Locations for
Operational Sound, Noise & Vibration
Assessments**

Community Forum Area CFA04:
Kilburn (Brent) to Old Oak Common



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Scale at A3: 1:10,000

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Metres



Date: 29/10/13

Doc Number: C250-ARP-EV-MAP-000-003858



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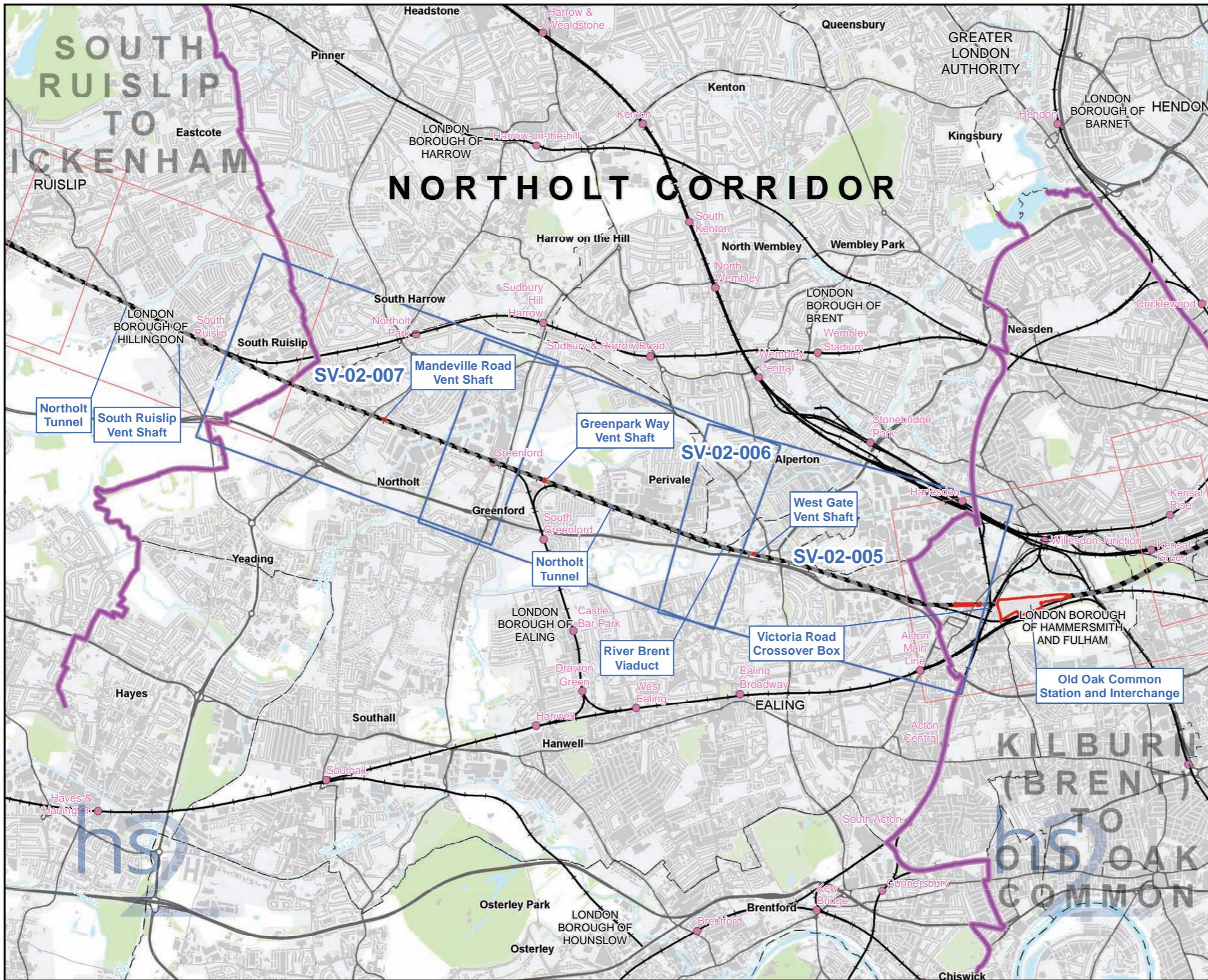
LONDON-WEST MIDLANDS ENVIRONMENTAL STATEMENT

CFA5 | Northolt Corridor

SV-02 - Operational Airborne Noise and Vibration Impacts and Likely Significant Effects
(with Assessment Locations)

SV-03 - Assessment and Monitoring Locations for Construction Sound, Noise & Vibration Assessments

SV-04 - Assessment and Monitoring Locations for Operational Sound, Noise & Vibration Assessments



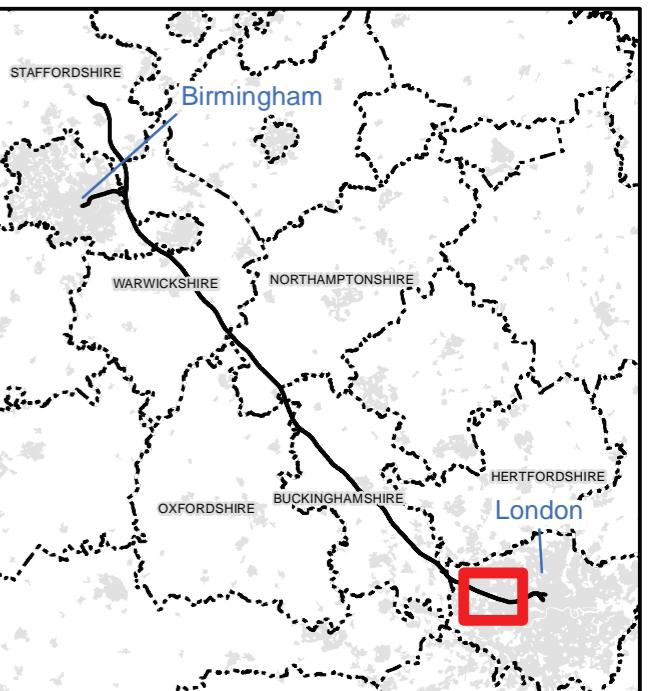
Main Map Legend

- Route in tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Community forum boundary
- Existing railway station
- County boundary
- District/Borough boundary

Map sheets included
in this community forum

Map sheets not included
in this community forum

Map Number	SV-02-INDEX-CFA5
Map Name	Index Map of: Operational Noise and Vibration Impacts and Likely Significant Effects (with Assessment Locations)
Community Forum Area CFA5: Northolt Corridor	



Map Series Information:

SV-02 presents the direct operational noise impacts and likely significant effects of the Proposed Scheme.

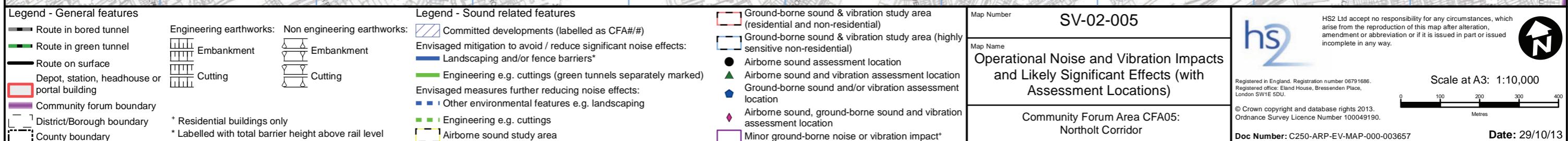
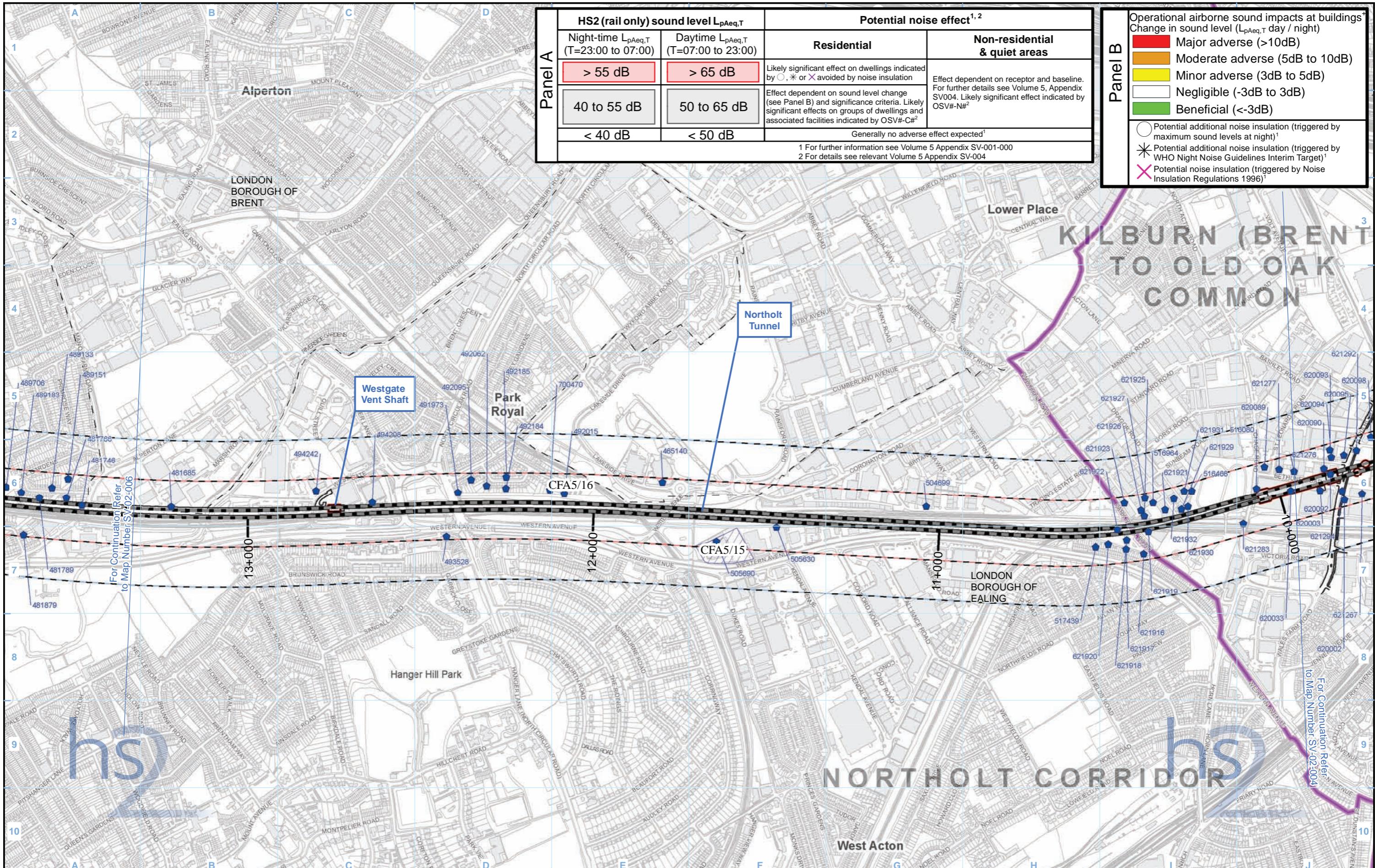
The SV-02 figure series necessarily contains a large amount of information relating to the operational noise and vibration assessment. It is designed to communicate visually the assessment process from the prediction of impacts to the determination of likely residual significant effects. The corresponding text is included in Vol2 and Vol5.

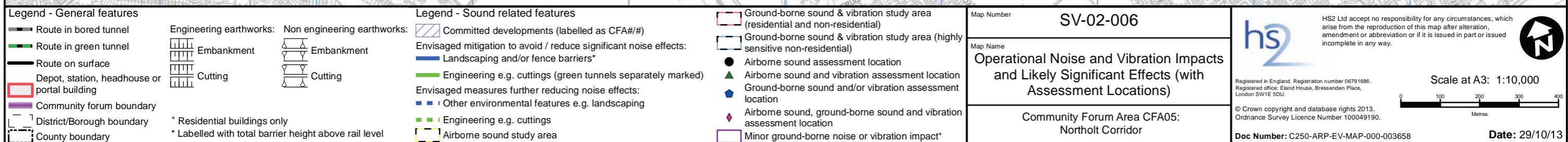
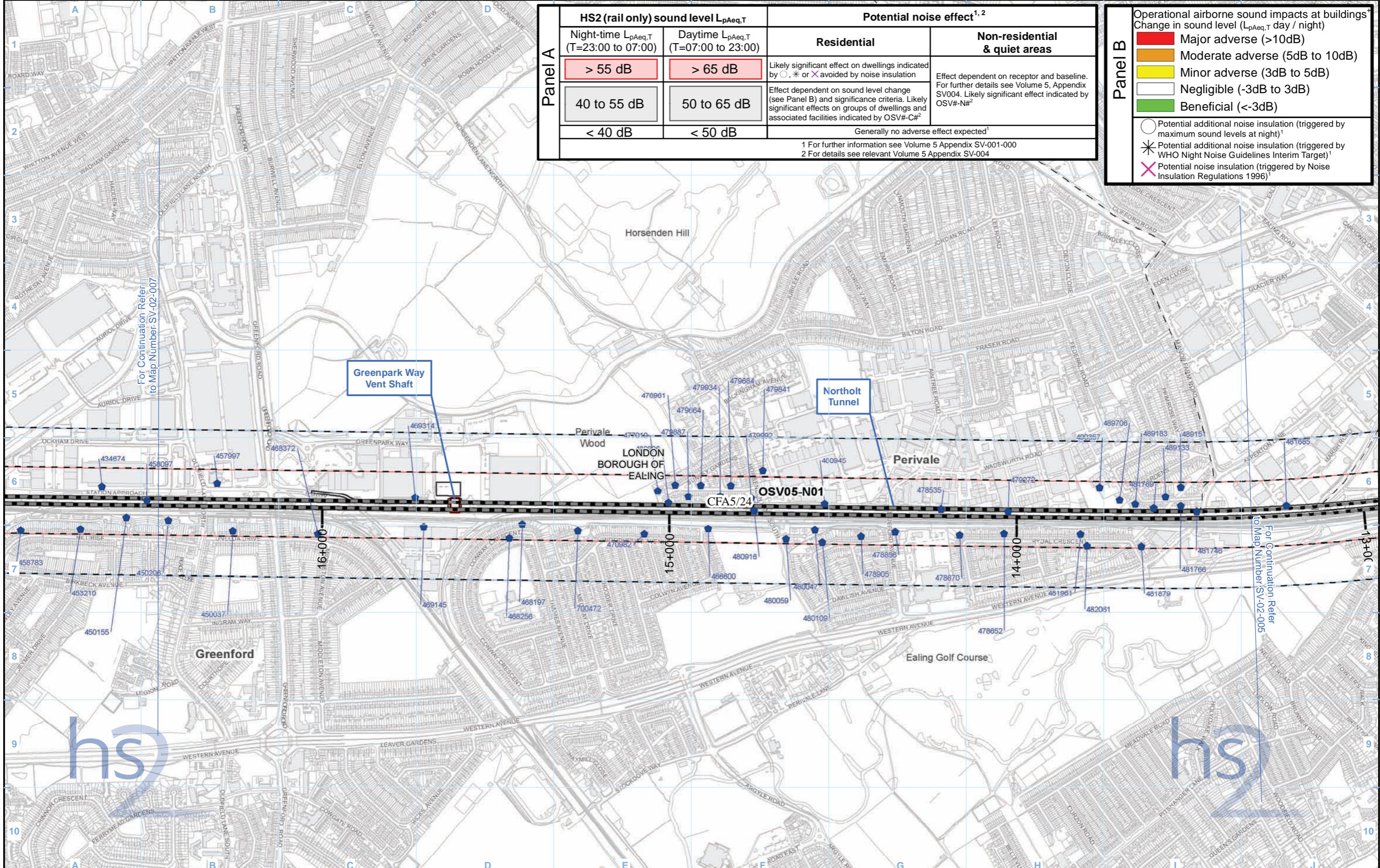
Key items on the map include the following:

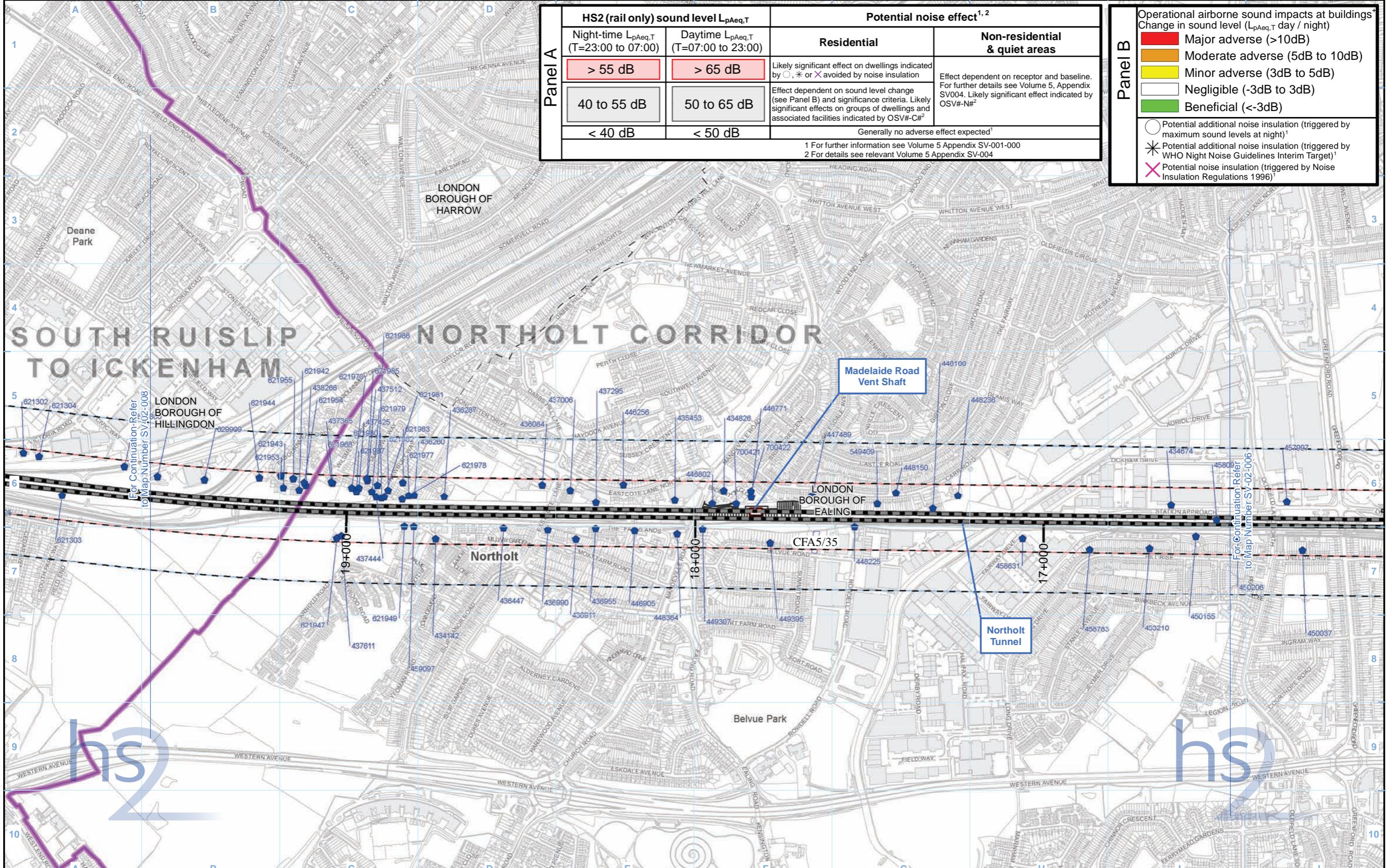
- The Proposed Scheme (the proposed railway alignments and surrounding associated earthworks/roads);
- blue and green lines representing the wayside airborne noise mitigation measures included in the Proposed Scheme;
- the study areas, which indicate the areas within which direct sound and vibration impacts of the scheme have been quantitatively assessed;
- the calculated direct operational impacts of the scheme, displayed as colour-coded buildings and symbols representing buildings that would potentially qualify for noise insulation;
- sound contours representing sound produced by the new railway (displayed in a simpler manner than on SV-01 in order not to obscure other features on the map series);
- the assessment locations at which a quantitative prediction of sound and impacts have been carried out (representing a number of nearby buildings). These are labelled with a unique reference number to enable cross-reference to further detail regarding the assessments in Volume 5: Appendix SV-004; and
- labels indicating where the likely residual direct noise or vibration significant effects have been identified. These are labelled with a unique reference number to enable cross-reference to further detail regarding the assessments in Volume 5: Appendix SV-004.

A more detailed explanation of each legend item included on the figures can be found in the data dictionary.

Note: Not all data layers in the legend are represented on every map.







HS2 (rail only) sound level $L_{pAeq,T}$		Potential noise effect ^{1,2}	
Night-time $L_{pAeq,T}$ (T=23:00 to 07:00)	Daytime $L_{pAeq,T}$ (T=07:00 to 23:00)	Residential	Non-residential & quiet areas
> 55 dB	> 65 dB	Likely significant effect on dwellings indicated by ○, * or X avoided by noise insulation	Effect dependent on receptor and baseline. For further details see Volume 5, Appendix SV004. Likely significant effect indicated by OSV#-N# ²
40 to 55 dB	50 to 65 dB	Effect dependent on sound level change (see Panel B) and significance criteria. Likely significant effects on groups of dwellings and associated facilities indicated by OSV#-C# ²	
< 40 dB	< 50 dB	Generally no adverse effect expected ¹	

¹ For further information see Volume 5 Appendix SV-001-000

² For details see relevant Volume 5 Appendix SV-004

Operational airborne sound impacts at buildings ¹	
Change in sound level ($L_{pAeq,T}$ day / night)	
Major adverse (>10dB)	
Moderate adverse (5dB to 10dB)	
Minor adverse (3dB to 5dB)	
Negligible (-3dB to 3dB)	
Beneficial (<-3dB)	
Potential additional noise insulation (triggered by maximum sound levels at night) ¹	
Potential additional noise insulation (triggered by WHO Night Noise Guidelines Interim Target) ¹	
Potential noise insulation (triggered by Noise Insulation Regulations 1996) ¹	

Legend - General features

- Route in bored tunnel
- Route in green tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Community forum boundary
- District/Borough boundary
- County boundary

* Residential buildings only

* Labelled with total barrier height above rail level

Engineering earthworks: Non engineering earthworks: Embankment Cutting

Legend - Sound related features

- Committed developments (labelled as CFA##)
- Ground-borne sound & vibration study area (residential and non-residential)
- Ground-borne sound & vibration study area (highly sensitive non-residential)
- Envisaged mitigation to avoid / reduce significant noise effects: Landscaping and/or fence barriers*
- Airborne sound assessment location
- Engineering e.g. cuttings (green tunnels separately marked)
- Ground-borne sound and/or vibration assessment location
- Envisaged measures further reducing noise effects: Other environmental features e.g. landscaping
- Other environmental features e.g. landscaping
- Engineering e.g. cuttings
- Airborne sound, ground-borne sound and vibration assessment location
- Minor ground-borne noise or vibration impact*
- Airborne sound study area

Legend - Sound related features

- Committed developments (labelled as CFA##)
- Ground-borne sound & vibration study area (residential and non-residential)
- Ground-borne sound & vibration study area (highly sensitive non-residential)
- Envisaged mitigation to avoid / reduce significant noise effects: Landscaping and/or fence barriers*
- Airborne sound assessment location
- Engineering e.g. cuttings (green tunnels separately marked)
- Ground-borne sound and/or vibration assessment location
- Envisaged measures further reducing noise effects: Other environmental features e.g. landscaping
- Other environmental features e.g. landscaping
- Engineering e.g. cuttings
- Airborne sound, ground-borne sound and vibration assessment location
- Minor ground-borne noise or vibration impact*
- Airborne sound study area

Map Number SV-02-007

Map Name Operational Noise and Vibration Impacts and Likely Significant Effects (with Assessment Locations)

Community Forum Area CFA05: Northolt Corridor

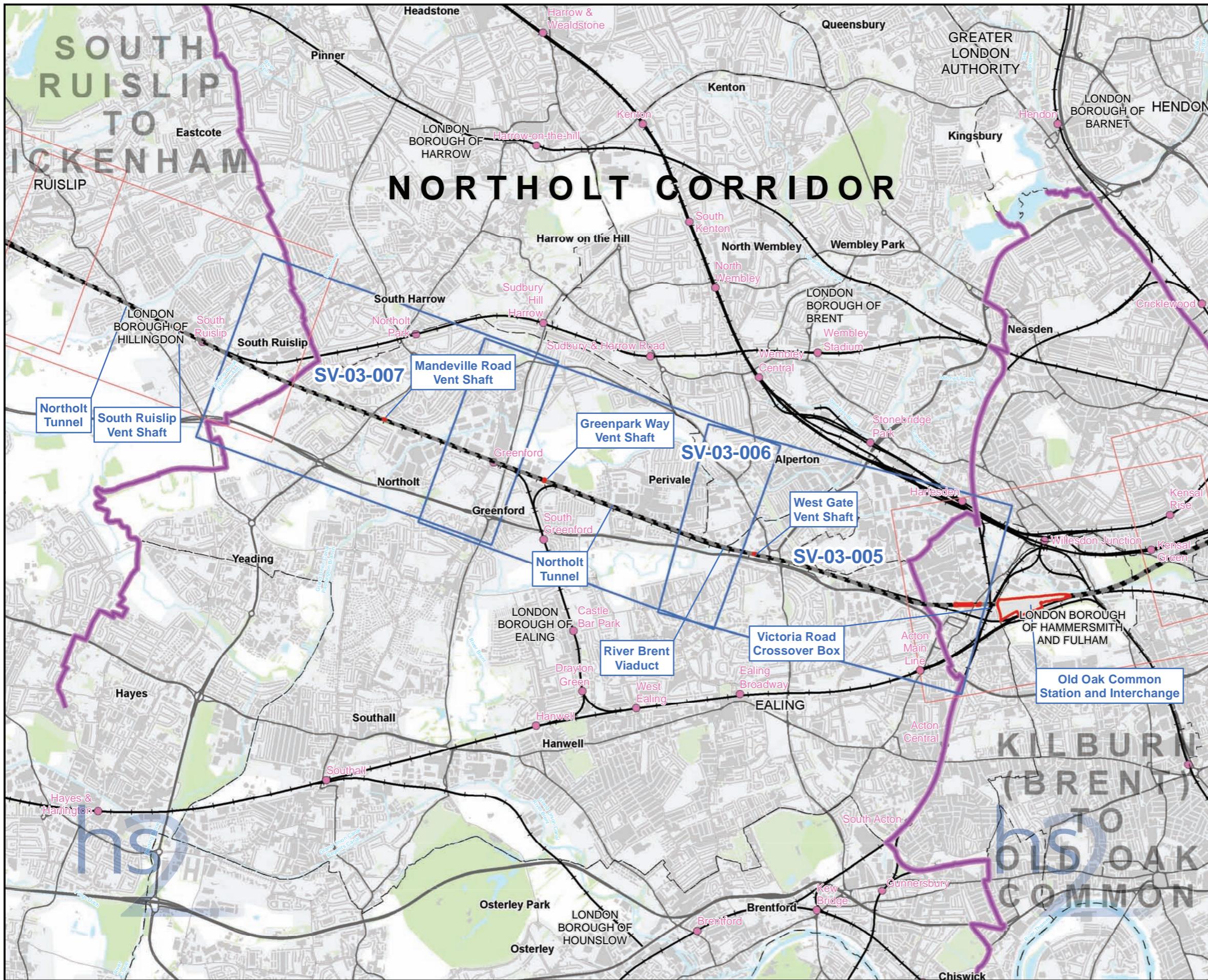
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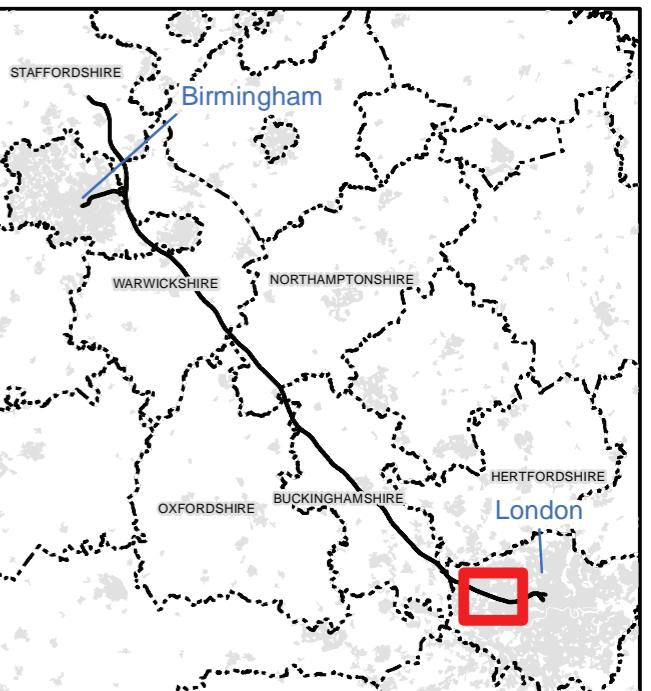
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Doc Number: C250-ARP-EV-MAP-000-003659 Date: 29/10/13



Main Map Legend	
Route in tunnel	Map sheets included
Route on surface	Map sheets not included
Depot, station, headhouse or portal building	in this community forum
Community forum boundary	in this community forum
Existing railway station	
County boundary	
District/Borough boundary	



Map Series Information:

The SV-03 figure series accompanies the construction noise & vibration assessments. It shows the locations at which a quantitative assessment of the direct effects of construction noise and/or vibration has been carried out. These are labelled as assessment locations with a reference number to enable cross-reference to the construction noise and vibration reports contained in Volume 5: Appendix SV-003 and Volume 5: Appendix SV-002.

The figure series also shows locations at which baseline sound measurements were carried out. These baseline measurement locations are labelled with a reference number to enable cross-reference to the baseline sound reports contained in Volume 5: Appendix SV-002.

A more detailed explanation of each legend item included on the figures can be found in the data dictionary.

Note: Not all data layers in the legend are represented on every map.

Map Number	SV-03-INDEX-CFA5
Map Name	Index Map of: Assessment and Monitoring Locations for Construction Sound, Noise & Vibration Assessments
Community Forum Area CFA5: Northolt Corridor	
Scale at A3: 1:50,000	



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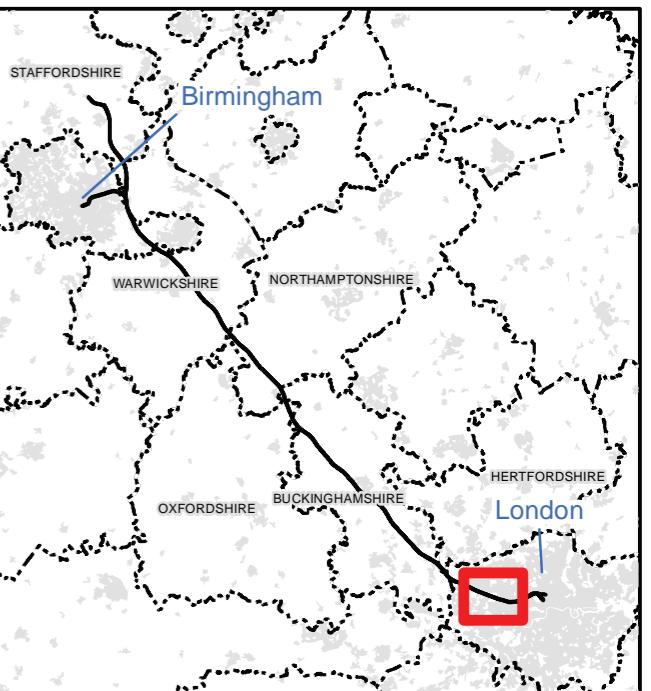
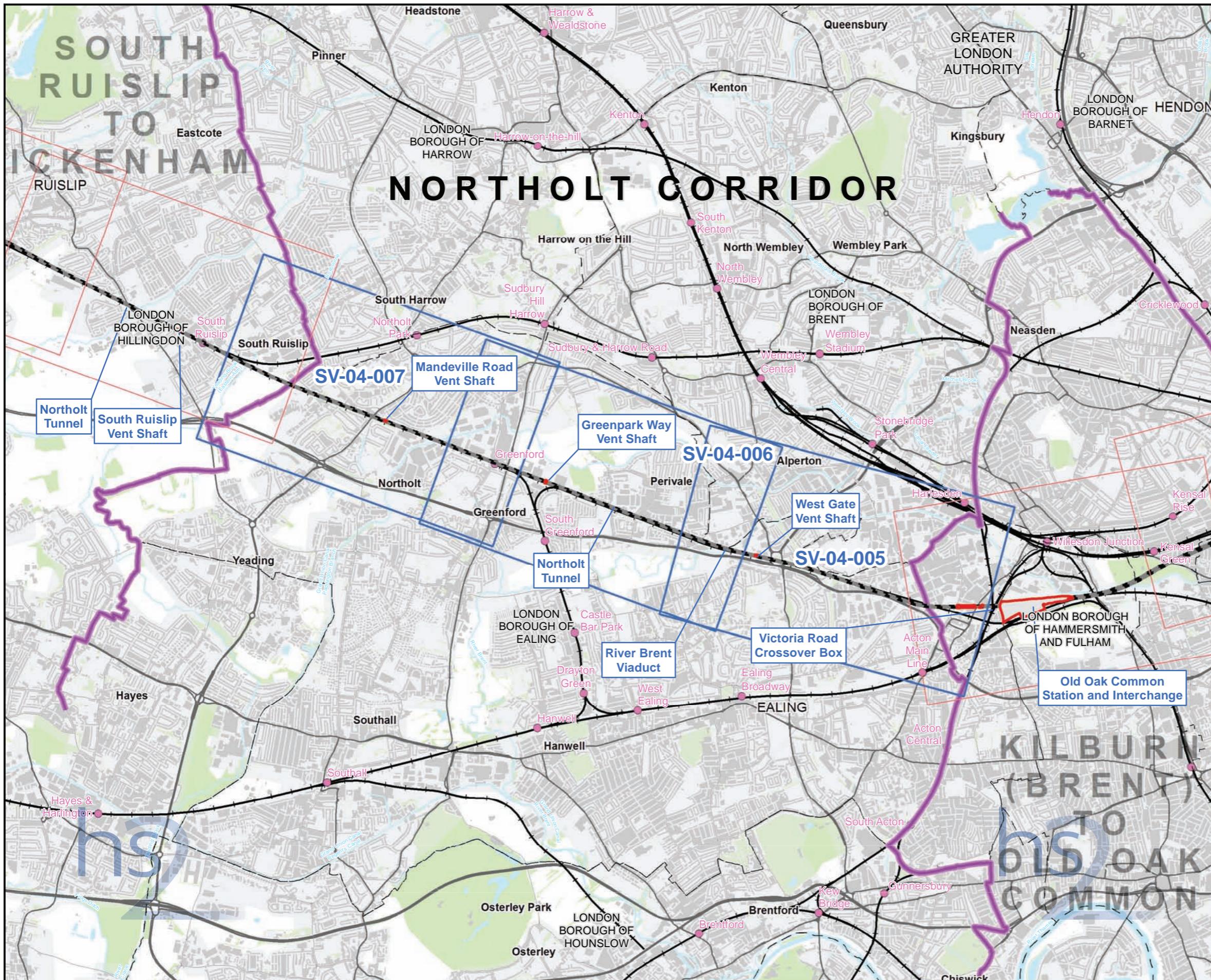


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Doc Number: C250-ARP-EV-MAP-000-004113-P06.00

Date: 29/10/13



Map Series Information:

The SV-04 figure series shows the locations at which a quantitative assessment of the direct effects of operational sound and/or vibration has been carried out. These are labelled as assessment locations with a reference number to enable cross-reference to the operational sound and vibration reports contained in Volume 5: Appendix SV-004 and Volume 5: Appendix SV-002.

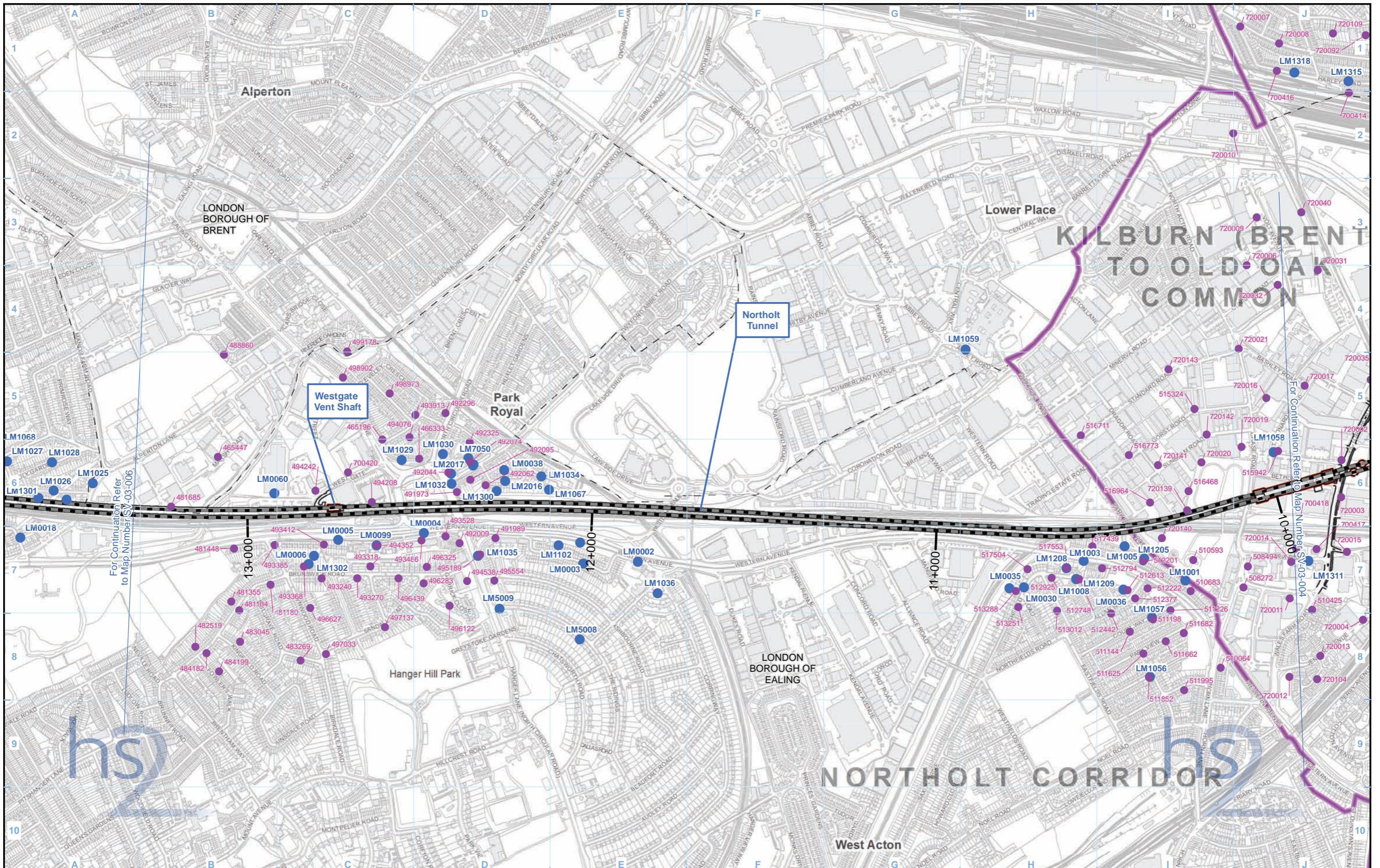
The figure series also shows locations at which baseline sound measurements were carried out. These baseline measurement locations are labelled with a reference number to enable cross-reference to the baseline sound reports contained in Volume 5: Appendix SV-002.

A more detailed explanation of each legend item included on the figures can be found in the data dictionary.

Note: Not all data layers in the legend are represented on every map.

Main Map Legend	
Route in tunnel	Map sheets included
Route on surface	Map sheets not included
Depot, station, headhouse or portal building	in this community forum
Community forum boundary	in this community forum
Existing railway station	
County boundary	
District/Borough boundary	

Map Number	SV-04-INDEX-CFA5
Map Name	Index Map of: Assessment and Monitoring Locations for Operational Sound, Noise & Vibration Assessments
Community Forum Area CFA5: Northolt Corridor	
Scale at A3: 1:50,000	



Legend - General features

- Route in bored tunnel
- Route in green tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Community forum boundary
- District/Borough boundary
- County boundary

Engineering earthworks: Non engineering earthworks:

Embankment	Cutting
Embankment	Cutting

Legend - Sound related features

- Construction airborne sound assessment location
- Construction vibration assessment locations
- Construction airborne sound and vibration assessment location
- Baseline measurement locations

Map Number SV-03-005
Map Name Assessment and Monitoring Locations for Construction Sound, Noise & Vibration Assessments
(labelled with Measurement Location reference code)

labelled with Assessment Location ID reference number (for details of the assessment results see relevant Vol 5 Appendix SV-003)

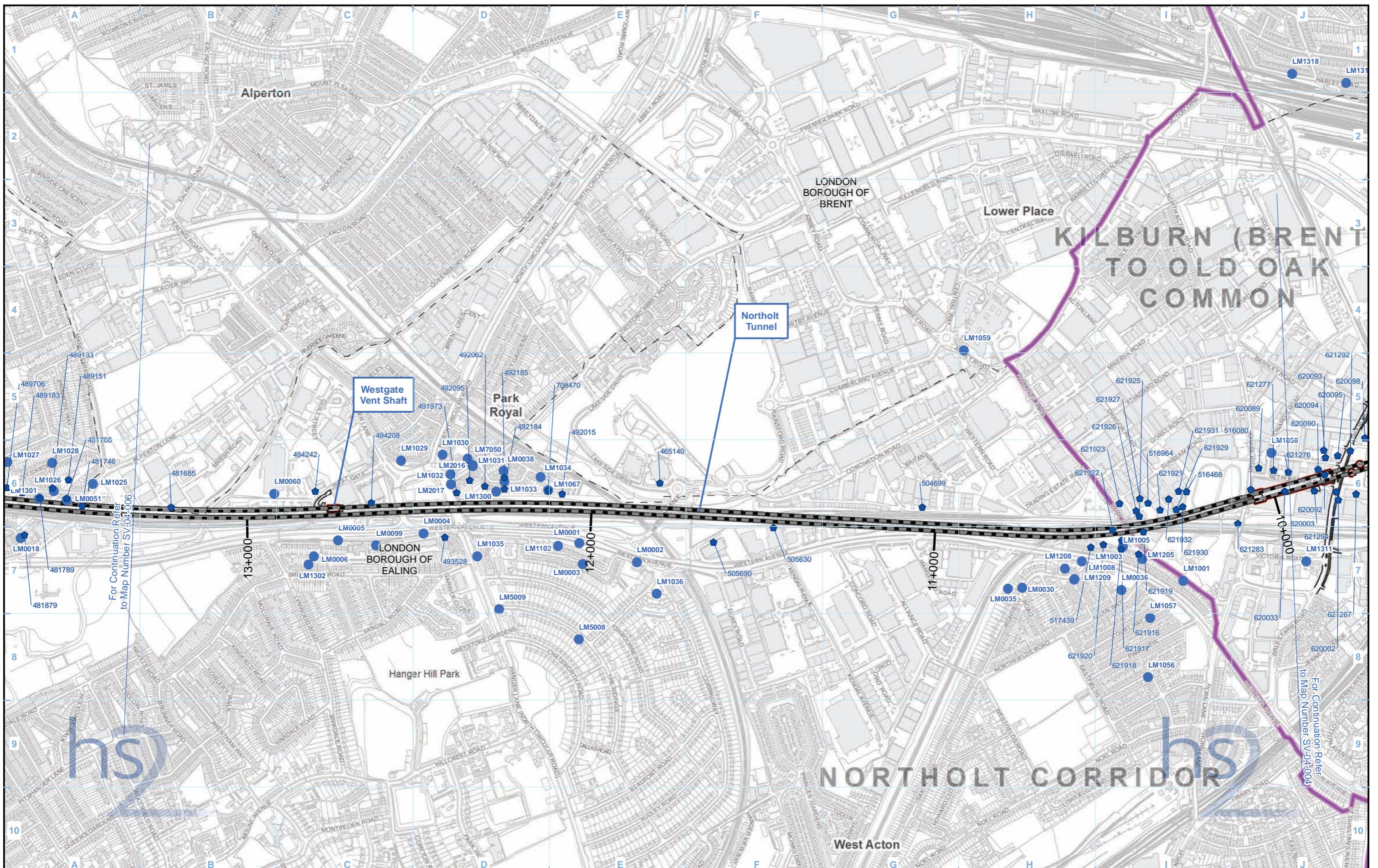
Map Number SV-03-005
Map Name Assessment and Monitoring Locations for Construction Sound, Noise & Vibration Assessments
Community Forum Area CFA05: Northolt Corridor

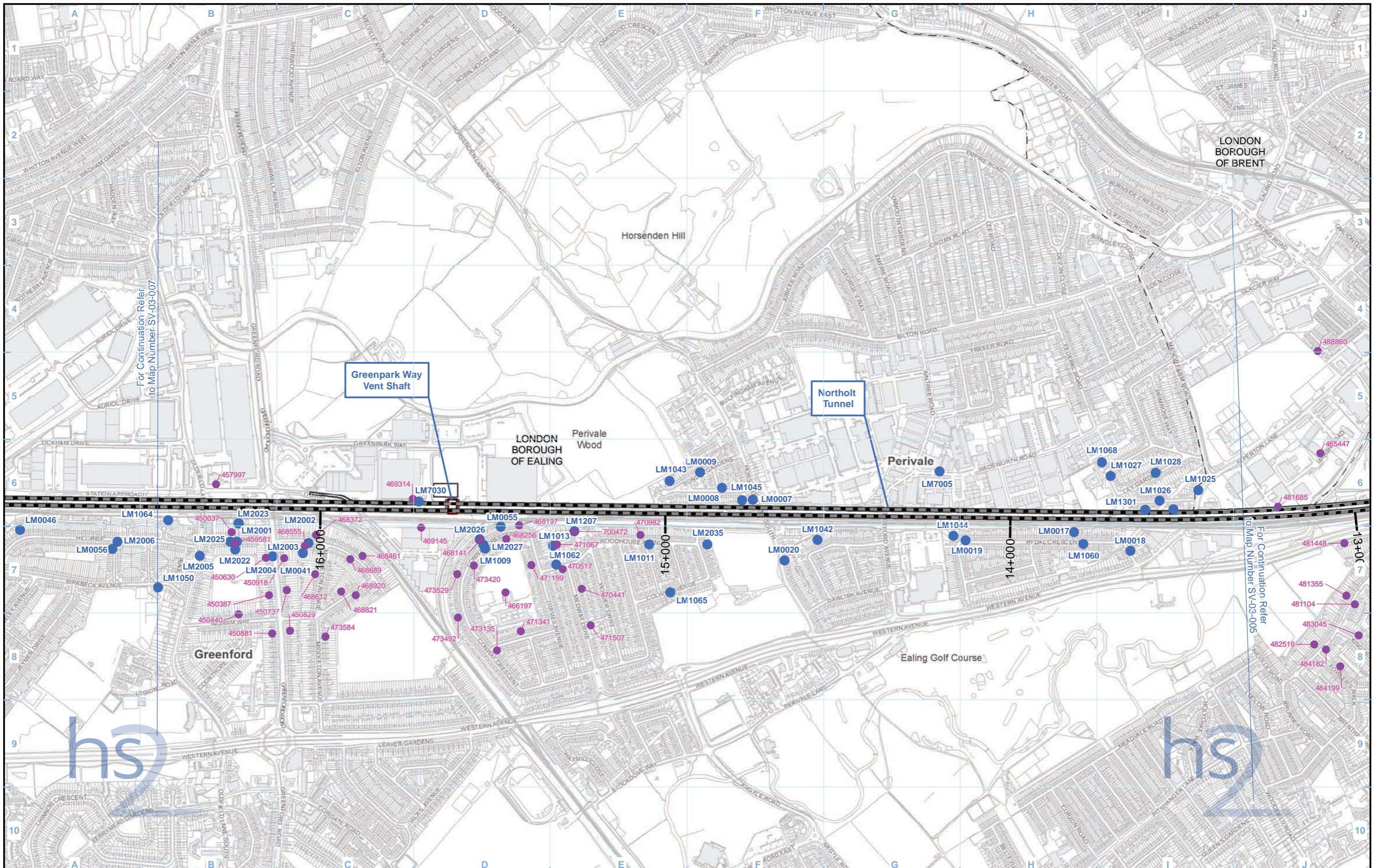
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 0 100 200 300 400 Metres

Date: 29/10/13





Legend - General features

- Route in bored tunnel
- Route in green tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Community forum boundary
- District/Borough boundary
- County boundary

Engineering earthworks: Non engineering earthworks:

	Embankment		Embankment
	Cutting		Cutting

Legend - Sound related features

- Construction airborne sound assessment location
- Construction vibration assessment locations
- Construction airborne sound and vibration assessment location
- Baseline measurement locations

Map Number SV-03-006
Map Name Assessment and Monitoring Locations for Construction Sound, Noise & Vibration Assessments
 (labelled with Measurement Location reference code)

labelled with Assessment Location ID reference number (for details of the assessment results see relevant Vol 5 Appendix SV-003)

Map Number SV-03-006
Map Name Assessment and Monitoring Locations for Construction Sound, Noise & Vibration Assessments
 (labelled with Measurement Location reference code)

Community Forum Area CFA05: Northolt Corridor

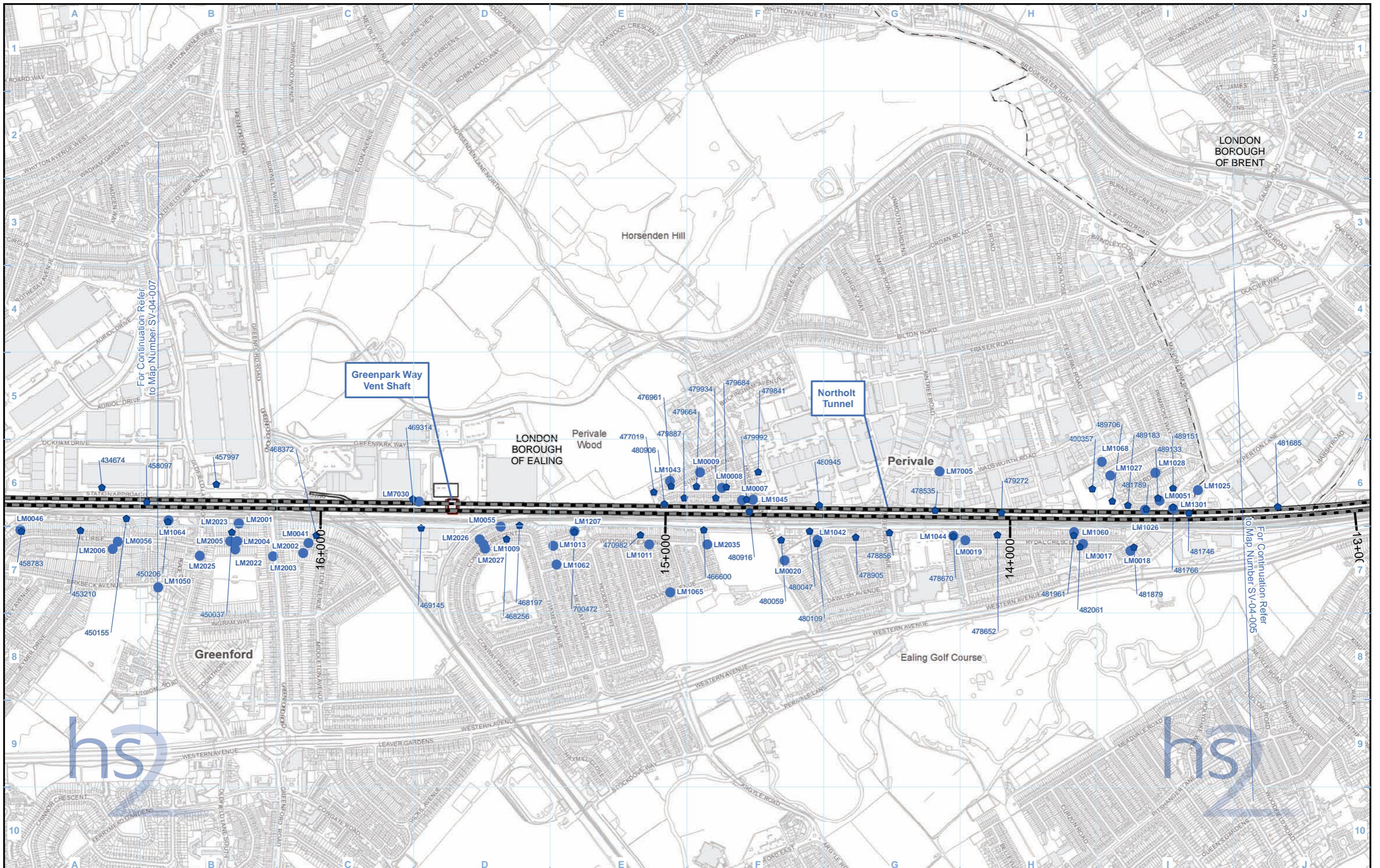
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Scale at A3: 1:10,000
 0 100 200 300 400 Metres

Date: 29/10/13


Legend - General features

- Route in bored tunnel
- Route in green tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Community forum boundary
- District/Borough boundary
- County boundary

- | | |
|-------------------------|-----------------------------|
| Engineering earthworks: | Non engineering earthworks: |
| | |
| Embankment | Embankment |
| | |
| Cutting | Cutting |
| | |

Legend - Sound related features

- Airborne sound assessment location
- ▲ Airborne sound and vibration assessment location
- ◆ Location
- ◆ Ground-borne sound and/or vibration assessment location
- ◆ Airborne sound, ground-borne sound and vibration assessment location
- Baseline measurement locations

labelled with Assessment Location ID reference number
 (for details of the assessment results see Vol 5 Appendix SV004)
 (labelled with Measurement Location reference code)

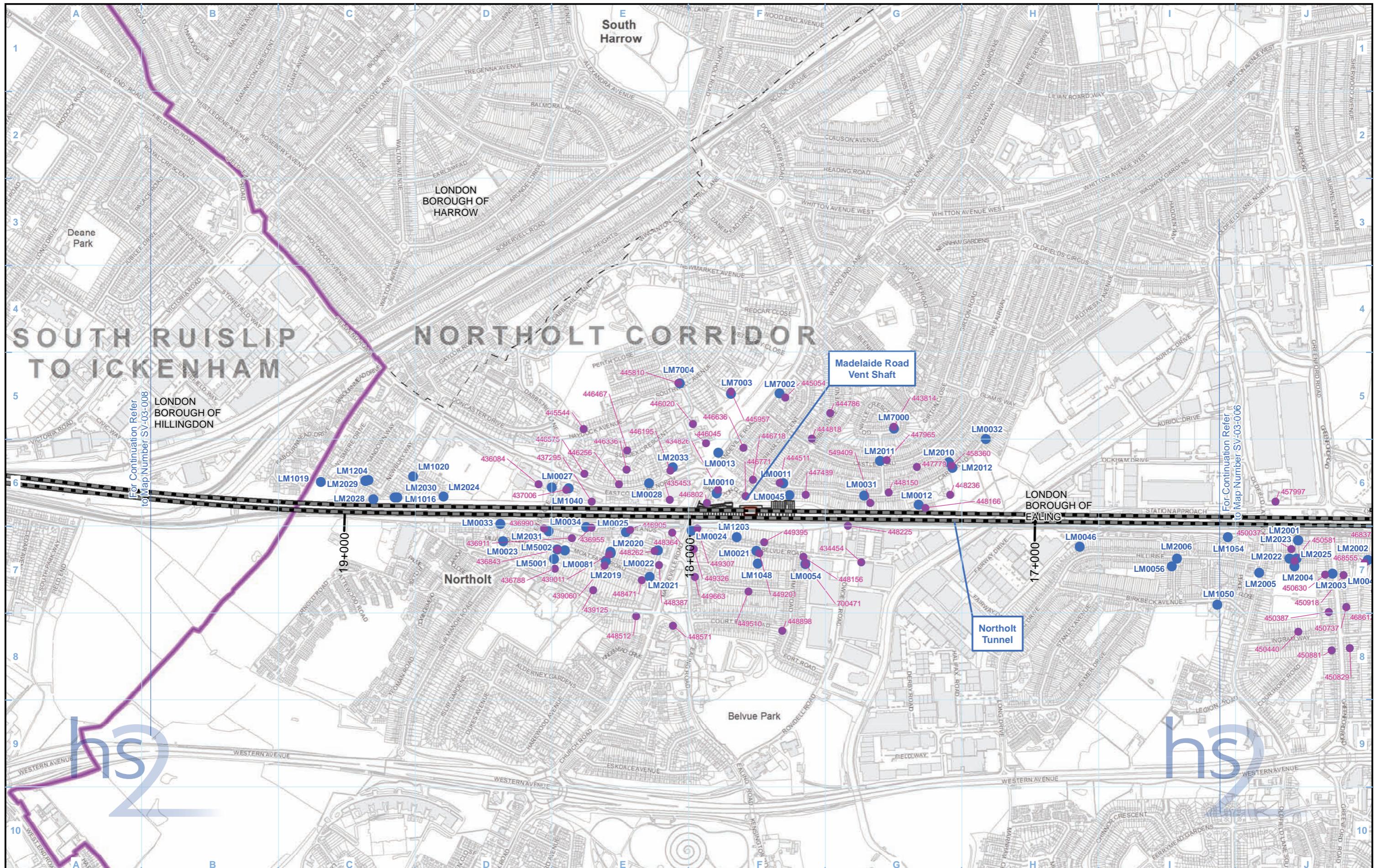
Map Number
SV-04-006
Map Name
Assessment and Monitoring Locations for Operational Sound, Noise & Vibration Assessments
**Community Forum Area CFA05:
Northolt Corridor**


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Scale at A3: 1:10,000





Legend - General features

- Route in bored tunnel
 - Route in green tunnel
 - Route on surface
 - Depot, station, headhouse or portal building
 - Community forum boundary
 - District/Borough boundary
 - County boundary

Engineering earthworks: Non engineering earthworks:

-

Legend - Sound related features

- Construction airborne sound assessment location
 - ◆ Construction vibration assessment location
 - ◆ Construction airborne sound and vibration assessment location
 - Baseline measurement locations

labelled with Assessment Location ID reference number

(for details of the assessment results see relevant Vol 5 Appendix SV-003)

(labelled with Measurement Location reference code)

Map Number

SV-03-007

Map Name

Assessment and Monitoring Locations for Construction Sound, Noise & Vibration Assessments

Community Forum Area CFA05
Northolt Corridor

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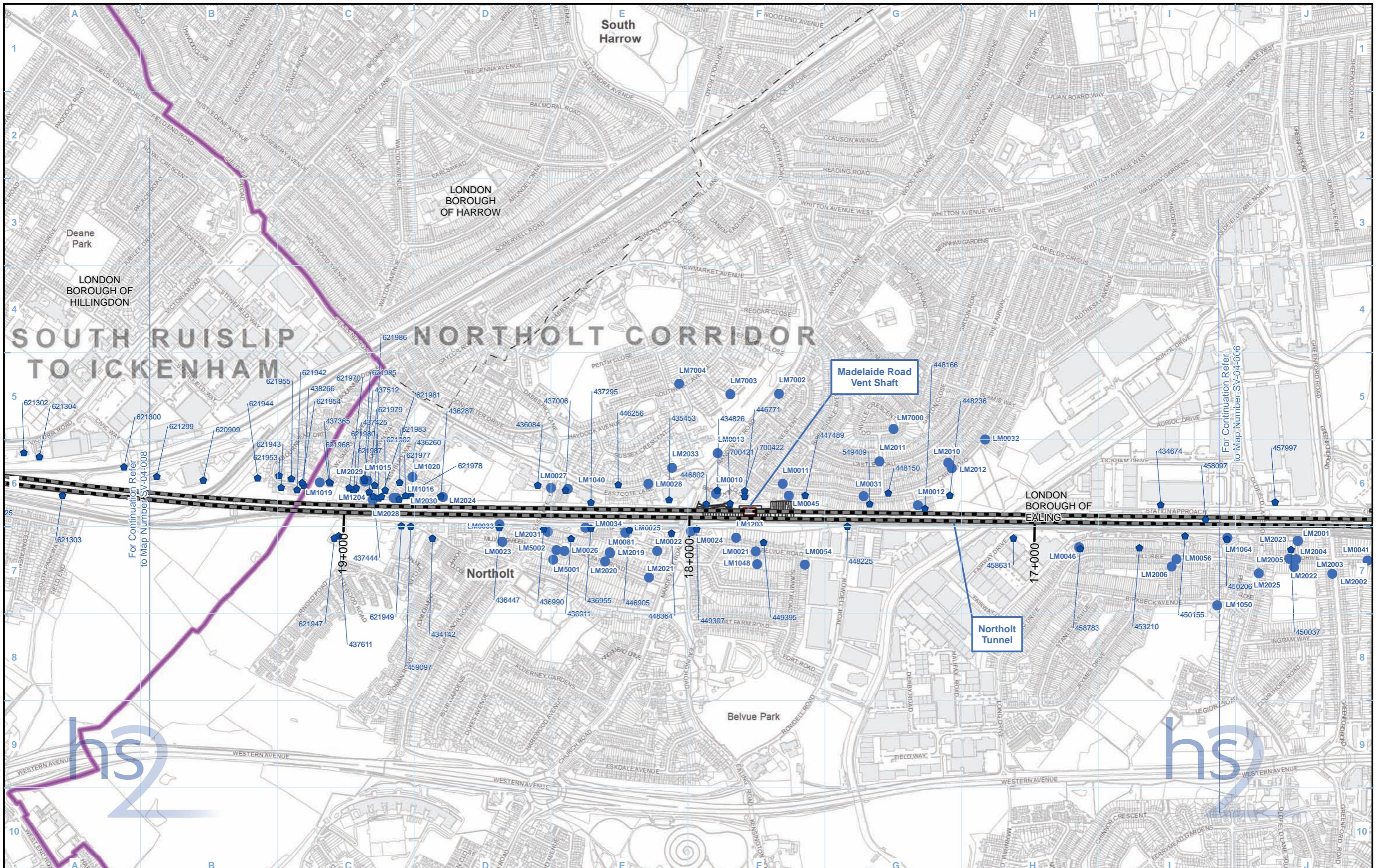


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Scale at A3: 1:10 000



Date: 29/10/13



Legend - General features

- Route in bored tunnel
- Route in green tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Community forum boundary
- District/Borough boundary
- County boundary

Engineering earthworks:

- Non engineering earthworks:
- Embankment
- Cutting

Legend - Sound related features

- Airborne sound assessment location
- Airborne sound and vibration assessment location
- Ground-borne sound and/or vibration assessment location
- Airborne sound, ground-borne sound and vibration assessment location
- Baseline measurement locations

labelled with Assessment Location ID reference number
(for details of the assessment results see Vol 5 Appendix SV004)

(labelled with Measurement Location reference code)

Map Number	SV-04-007
Map Name	Assessment and Monitoring Locations for Operational Sound, Noise & Vibration Assessments
Community Forum Area CFA05: Northolt Corridor	
Community Forum Area CFA05: Northolt Corridor	



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Date: 29/10/13



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LONDON-WEST MIDLANDS ENVIRONMENTAL STATEMENT

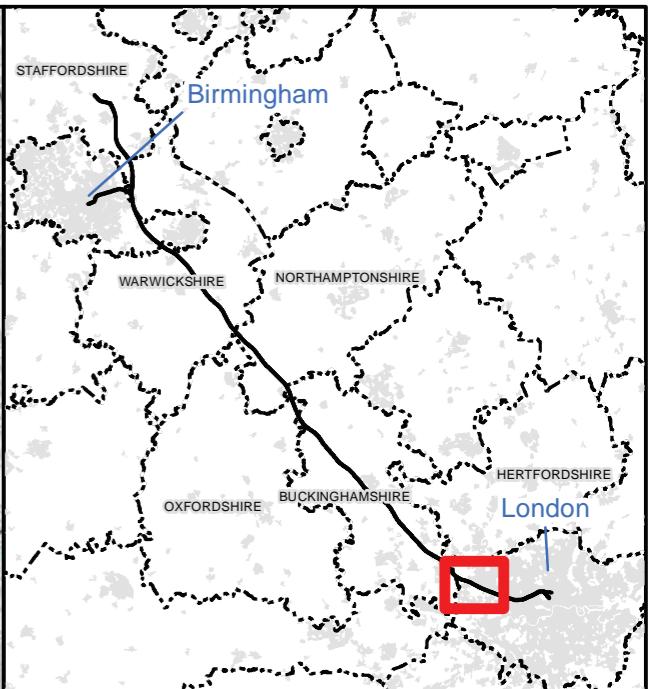
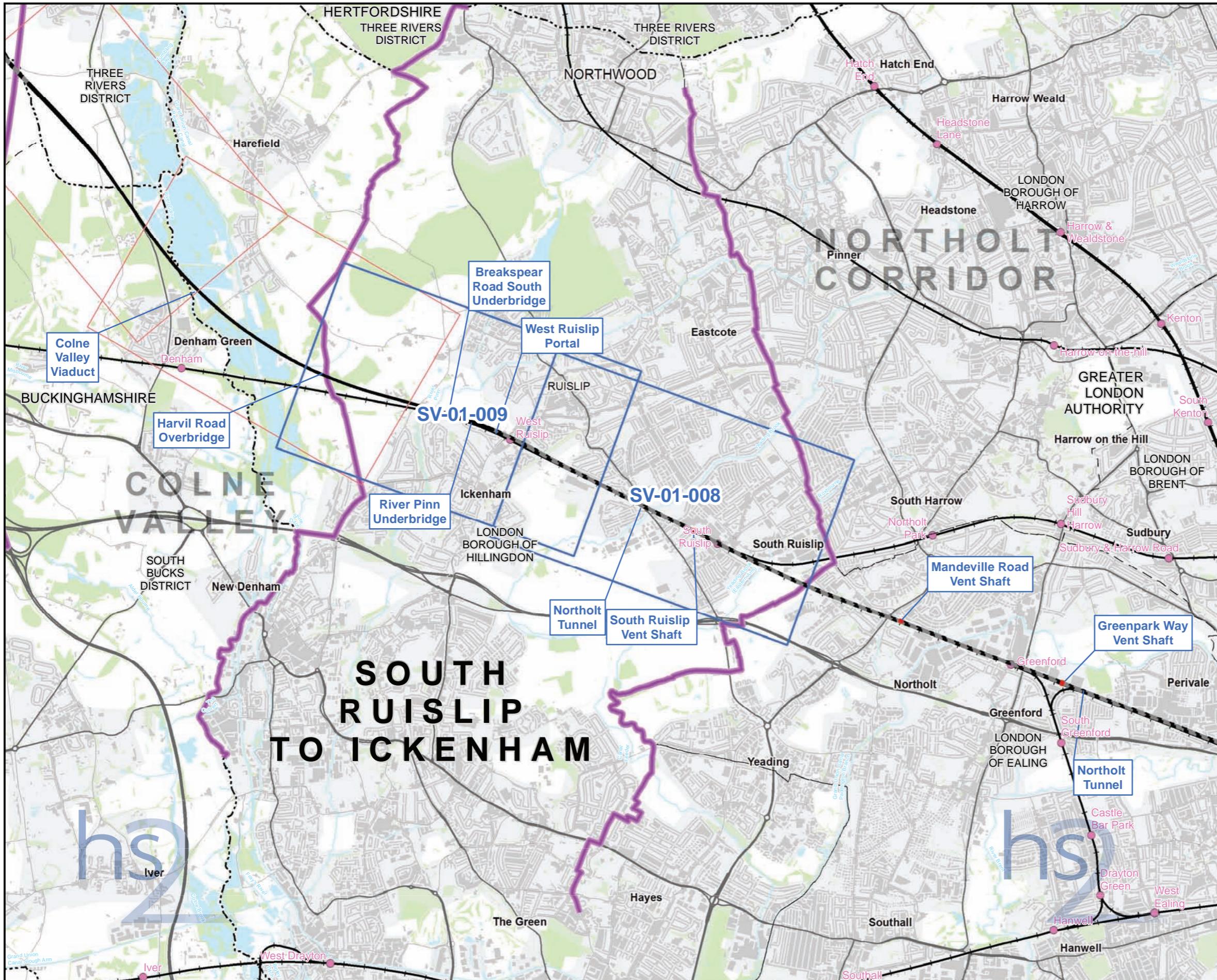
CFA6 | South Ruislip to Ickenham

SV-01 - Operational Sound Contour Maps and Likely Significant Effects

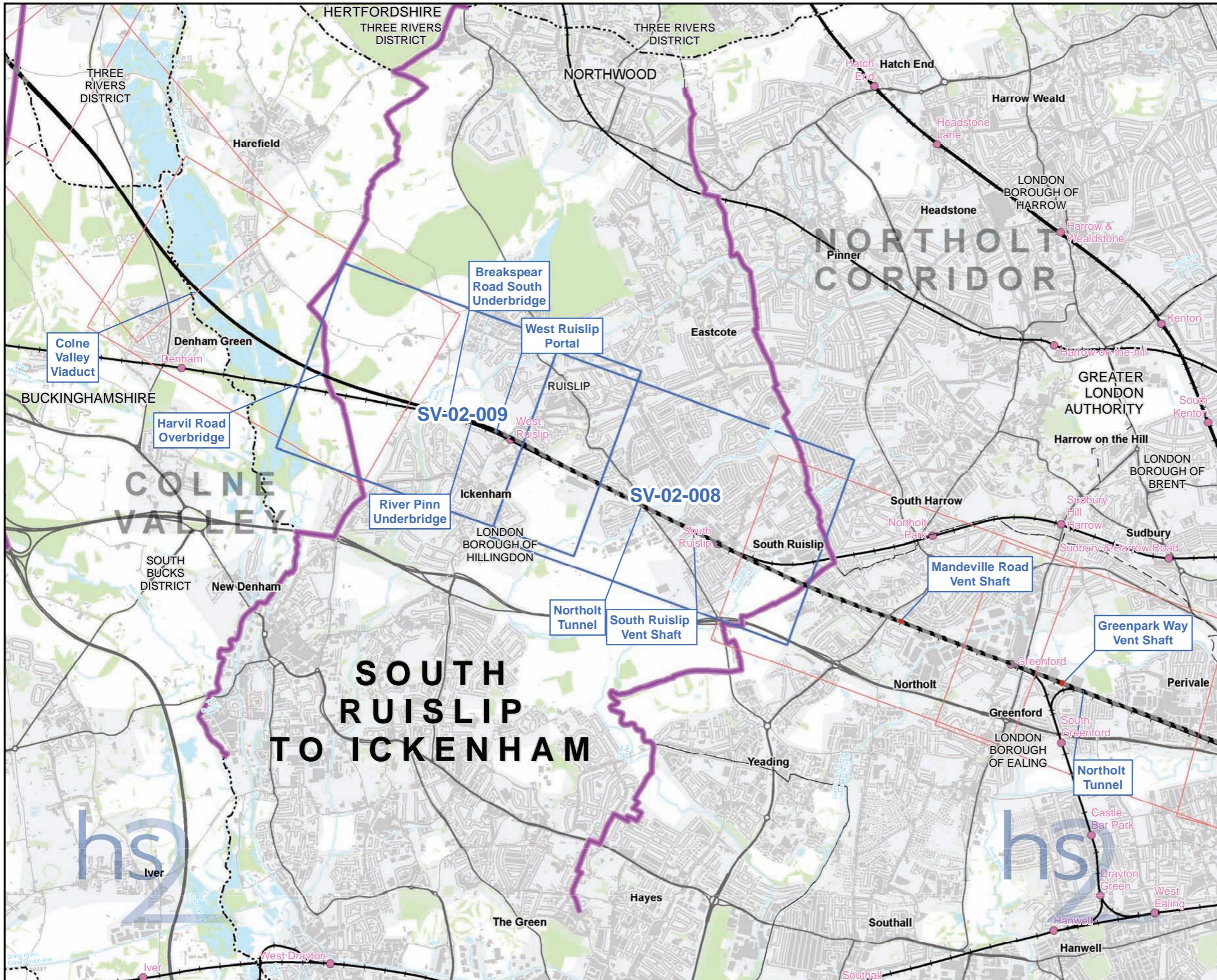
SV-02 - Operational Airborne Noise and Vibration Impacts and Likely Significant Effects
(with Assessment Locations)

SV-03 - Assessment and Monitoring Locations for Construction Sound, Noise & Vibration Assessments

SV-04 - Assessment and Monitoring Locations for Operational Sound, Noise & Vibration Assessments



Map Number	SV-01-INDEX-CFA6
Map Name	Index Map of: Operational Sound Contour Maps and Likely Significant Effects
Community Forum Area CFA6: South Ruislip to Ickenham	
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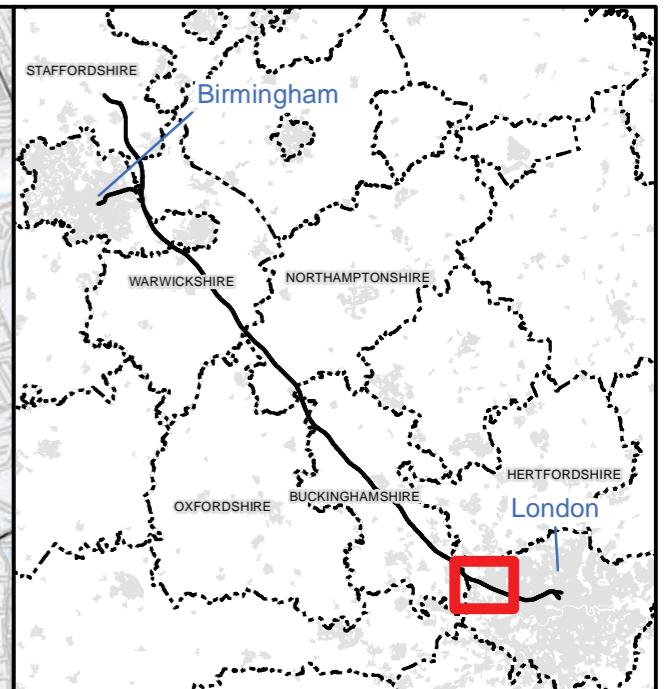
Main Map Legend

- Route in tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Community forum boundary
- Existing railway station
- County boundary
- District/Borough boundary
- Map sheets included in this community forum
- Map sheets not included in this community forum

Map Number: SV-02-INDEX-CFA6

Map Name: Index Map of:
Operational Noise and Vibration Impacts and Likely
Significant Effects (with Assessment Locations)

Community Forum Area CFA6:
South Ruislip to Ickenham



Map Series Information:

SV-02 presents the direct operational noise impacts and likely significant effects of the Proposed Scheme.

The SV-02 figure series necessarily contains a large amount of information relating to the operational noise and vibration assessment. It is designed to communicate visually the assessment process from the prediction of impacts to the determination of likely residual significant effects. The corresponding text is included in Vol2 and Vol5.

Key items on the map include the following:

- The Proposed Scheme (the proposed railway alignments and surrounding associated earthworks/roads);
- blue and green lines representing the wayside airborne noise mitigation measures included in the Proposed Scheme;
- the study areas, which indicate the areas within which direct sound and vibration impacts of the scheme have been quantitatively assessed;
- the calculated direct operational impacts of the scheme, displayed as colour-coded buildings and symbols representing buildings that would potentially qualify for noise insulation;
- sound contours representing sound produced by the new railway (displayed in a simpler manner than on SV-01 in order not to obscure other features on the map series);
- the assessment locations at which a quantitative prediction of sound and impacts have been carried out (representing a number of nearby buildings). These are labelled with a unique reference number to enable cross-reference to further detail regarding the assessments in Volume 5: Appendix SV-004; and
- labels indicating where the likely residual direct noise or vibration significant effects have been identified. These are labelled with a unique reference number to enable cross-reference to further detail regarding the assessments in Volume 5: Appendix SV-004.

A more detailed explanation of each legend item included on the figures can be found in the data dictionary.

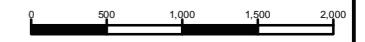
Note: Not all data layers in the legend are represented on every map.



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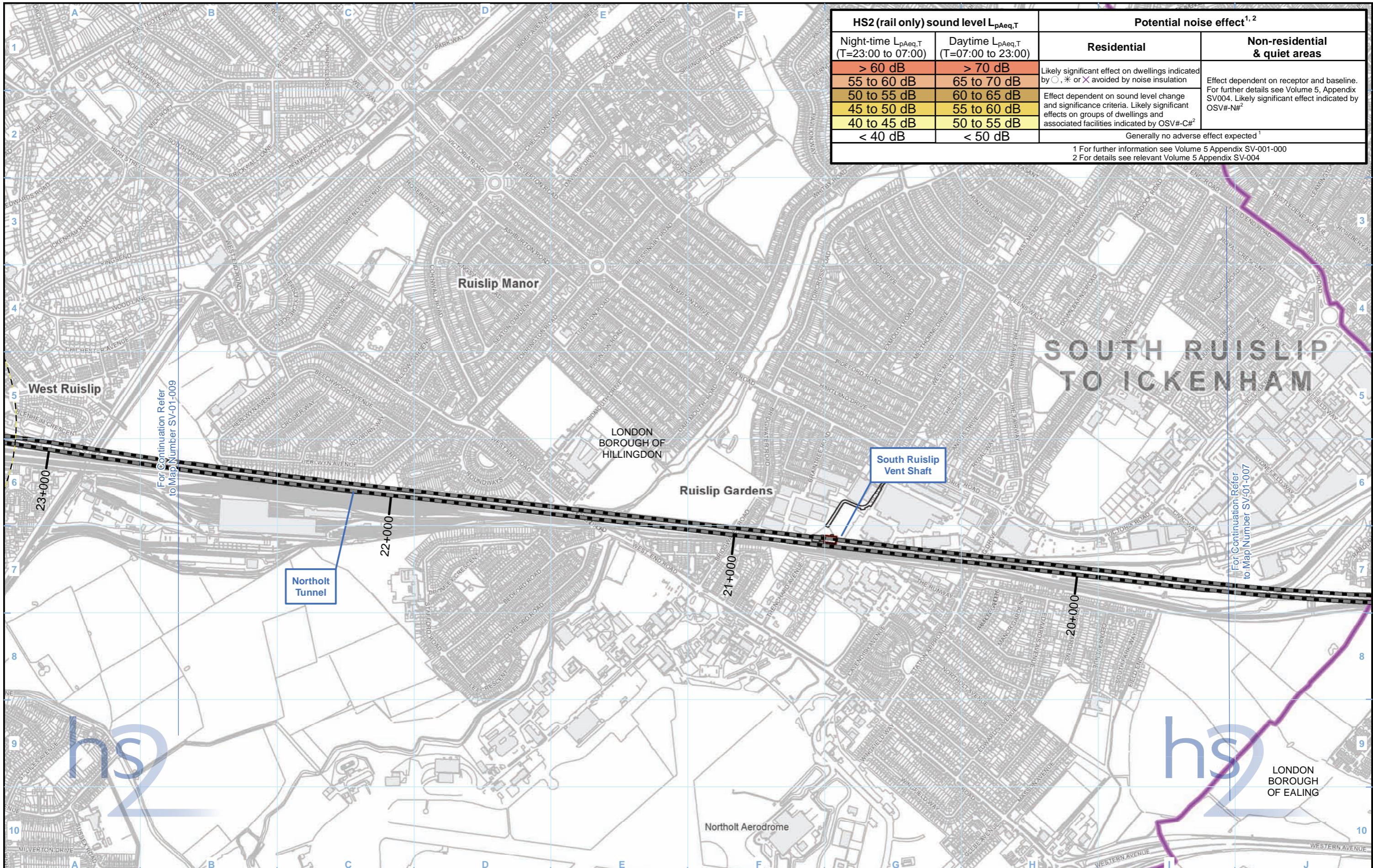
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Legend - General features

- Route in bored tunnel
- Route in green tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Community forum boundary
- District/Borough boundary
- County boundary

Engineering earthworks:

- Embankment
- Cutting

Non engineering earthworks:

- Embankment
- Cutting

Legend - Sound related features

- Envisaged mitigation to avoid / reduce significant noise effects:
 - Landscaping and/or fence barriers*
 - Engineering e.g. cuttings (green tunnels separately marked)
- Envisaged measures further reducing noise effects:
 - Other environmental e.g. landscaping
 - Engineering e.g. cuttings

- Airborne sound study area
- Potential additional noise insulation (triggered by maximum sound levels at night)¹
- Potential additional noise insulation (triggered by WHO Night Noise Guidelines Interim Target)¹
- Potential noise insulation (triggered by Noise Insulation Regulations 1996)¹

* Labelled with total barrier height above rail level

Map Number SV-01-008

Map Name Operational Sound Contour Maps and Likely Significant Effects

Community Forum Area CFA06:
South Ruislip to Ickenham



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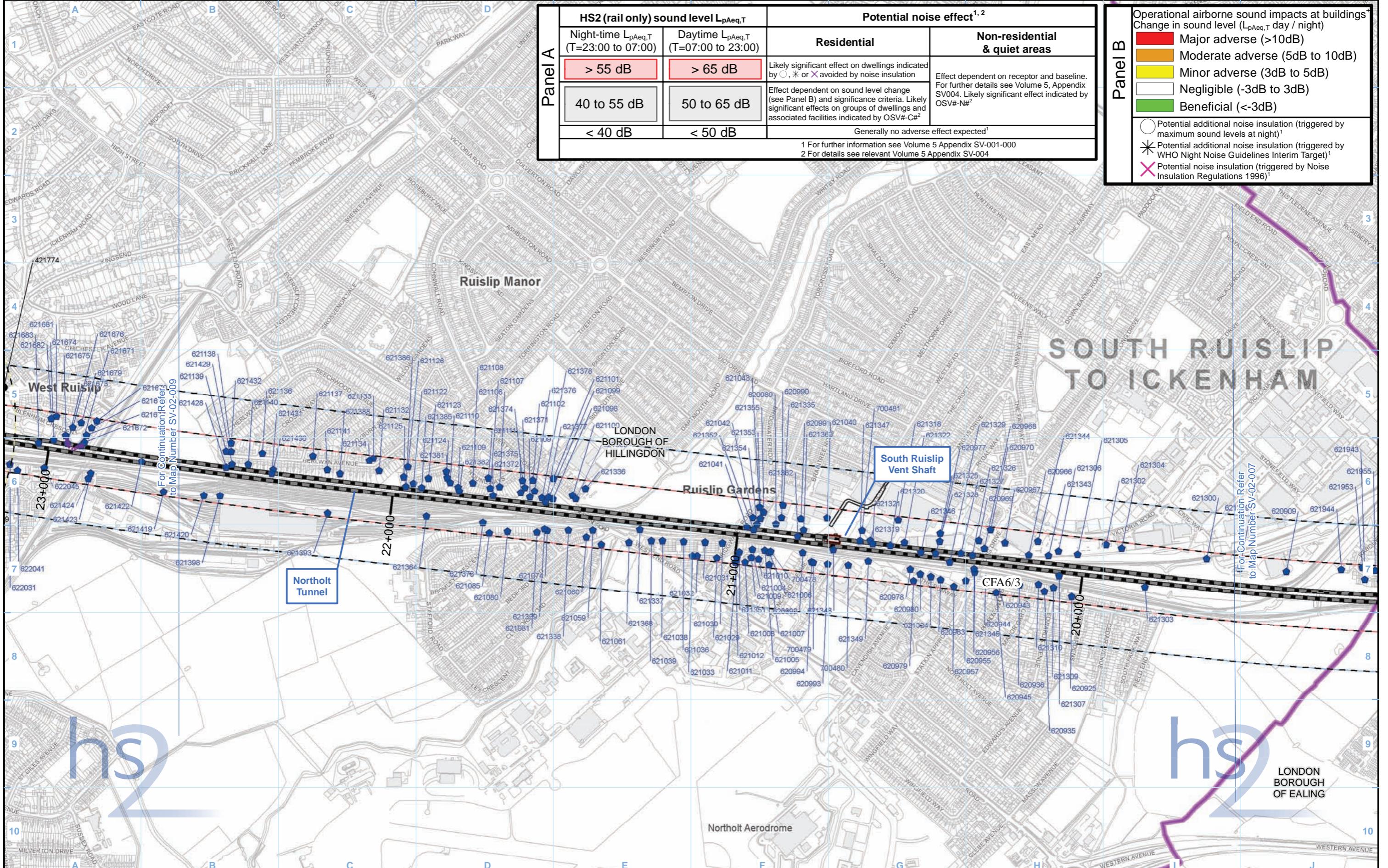
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Date: 29/10/13

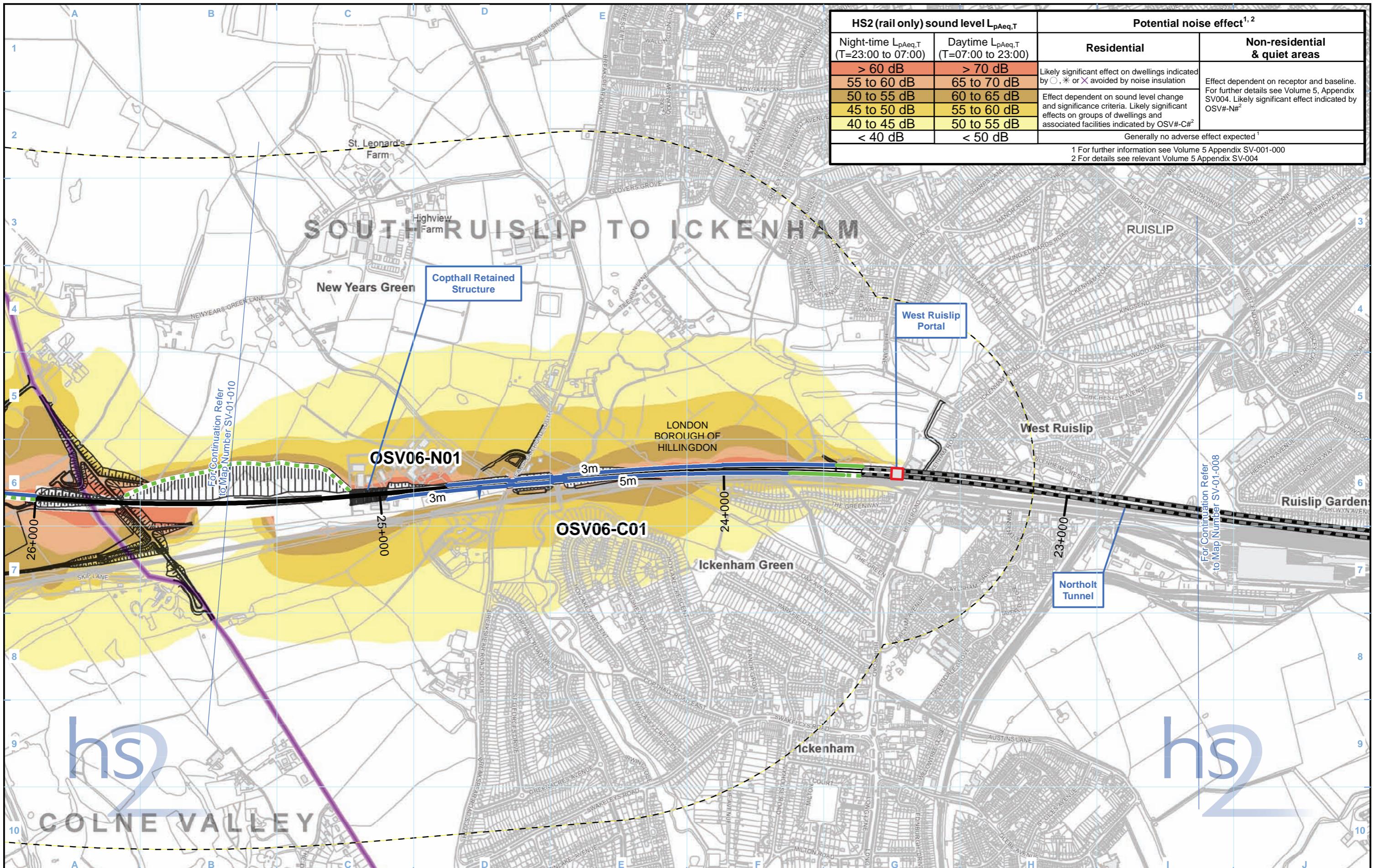
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Doc Number: C250-ARP-EV-MAP-000-003554



Legend - General features		Legend - Sound related features		Map Number		Map Name		HS2 Ltd accept no responsibility for any circumstances, which arise from the reproduction of this map after alteration, amendment or abbreviation or if it is issued in part or issued incomplete in any way.	
Route in bored tunnel	Engineering earthworks: Non engineering earthworks:	Committed developments (labelled as CFA##)	Ground-borne sound & vibration study area (residential and non-residential)	SV-02-008	hs	Operational Noise and Vibration Impacts and Likely Significant Effects (with Assessment Locations)		Registered in England. Registration number 06791686. Registered office: Eland House, Bressenden Place, London SW1E 5DU.	
Route in green tunnel	Embankment	Ground-borne sound & vibration study area (highly sensitive non-residential)						© Crown copyright and database rights 2013. Ordnance Survey Licence Number 100049190.	Scale at A3: 1:10,000
Route on surface	Cutting	Landscape and/or fence barriers*	Airborne sound assessment location						0 100 200 300 400 Metres
Depot, station, headhouse or portal building	Cutting	Engineering e.g. cuttings (green tunnels separately marked)	Airborne sound and vibration assessment location						Date: 29/10/13
Community forum boundary		Envisaged mitigation to avoid / reduce significant noise effects:	Ground-borne sound and/or vibration assessment location						
District/Borough boundary		Landscaping and/or fence barriers*	Other environmental features e.g. landscaping						
County boundary		Engineering e.g. cuttings	Other environmental features e.g. landscaping						
* Residential buildings only		Envisaged measures further reducing noise effects:	Airborne sound, ground-borne sound and vibration assessment location						
* Labelled with total barrier height above rail level		■ Other environmental features e.g. landscaping	Minor ground-borne noise or vibration impact*						



Legend - General features

- Route in bored tunnel
- Route in green tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Community forum boundary
- District/Borough boundary
- County boundary

Engineering earthworks:

- Embankment
- Cutting

Non engineering earthworks:

- Embankment
- Cutting

Legend - Sound related features

- Envisaged mitigation to avoid / reduce significant noise effects:
- Landscaping and/or fence barriers*
 - Engineering e.g. cuttings (green tunnels separately marked)
 - Other environmental e.g. landscaping
 - Engineering e.g. cuttings
- Envisaged measures further reducing noise effects:
- Potential additional noise insulation (triggered by maximum sound levels at night)¹
 - Potential additional noise insulation (triggered by WHO Night Noise Guidelines Interim Target)¹
 - Potential noise insulation (triggered by Noise Insulation Regulations 1996)¹

- * Labelled with total barrier height above rail level
- Airborne sound study area
 - Potential additional noise insulation (triggered by maximum sound levels at night)¹
 - Potential additional noise insulation (triggered by WHO Night Noise Guidelines Interim Target)¹
 - Potential noise insulation (triggered by Noise Insulation Regulations 1996)¹

Map Number SV-01-009

Map Name Operational Sound Contour Maps and Likely Significant Effects

Community Forum Area CFA06:
South Ruislip to Ickenham



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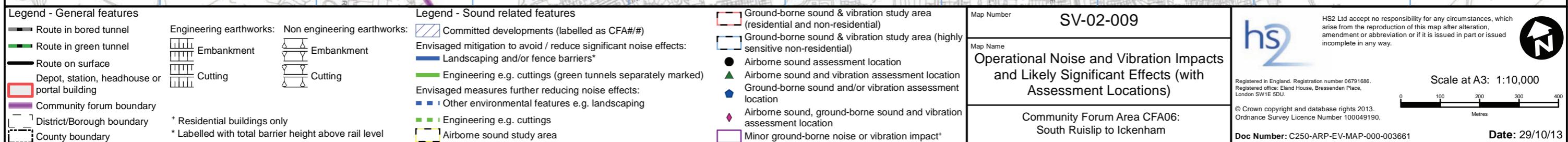
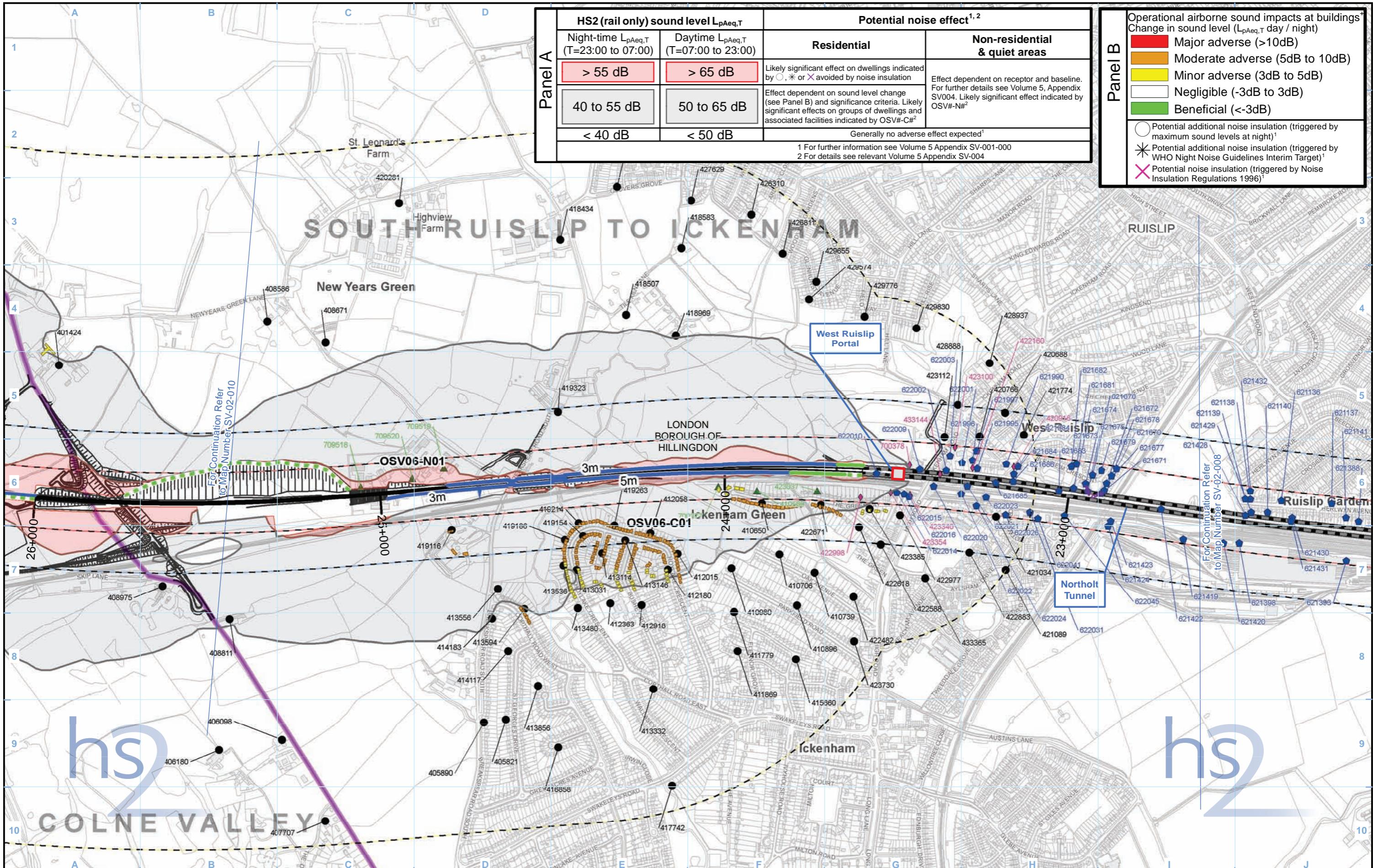
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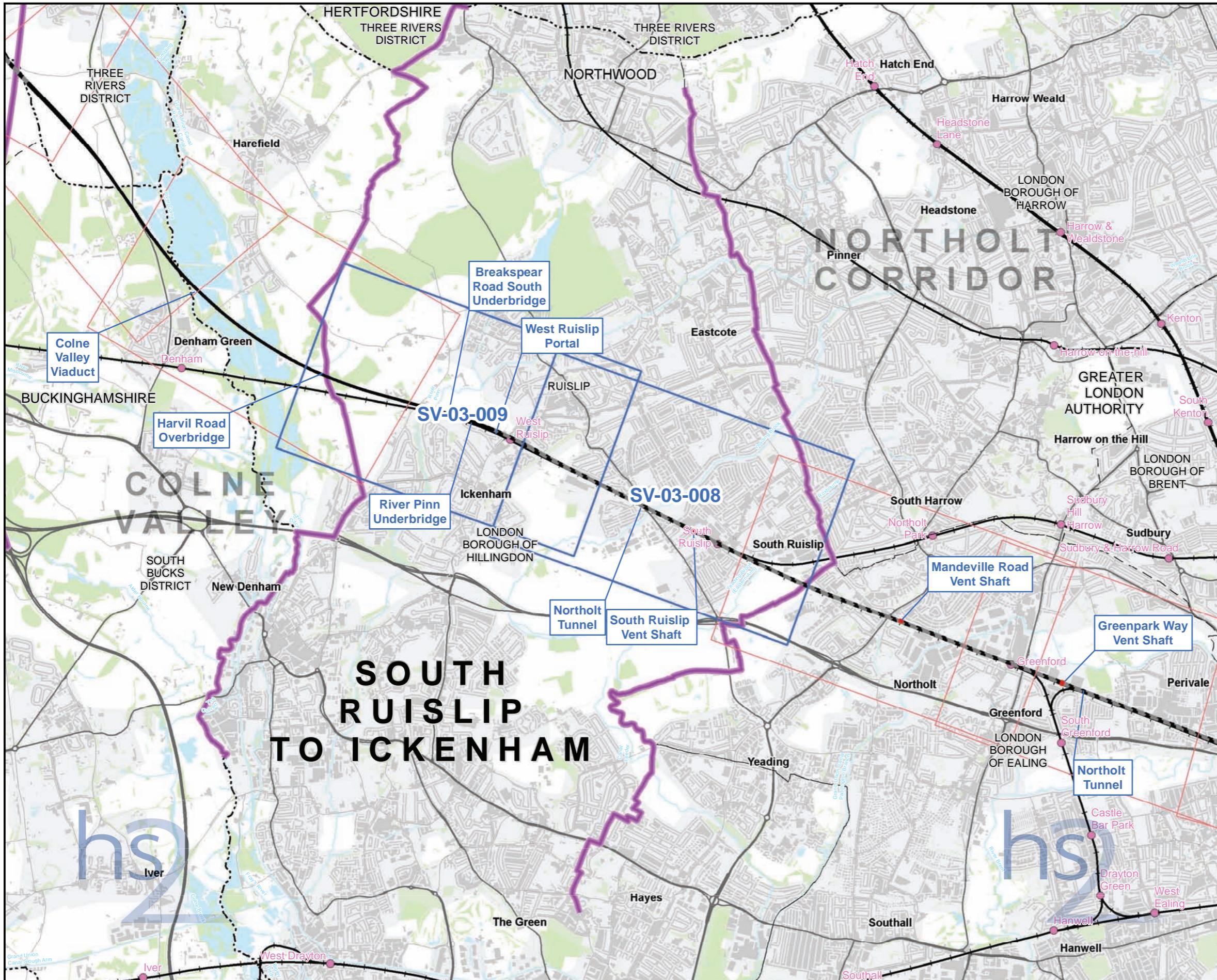
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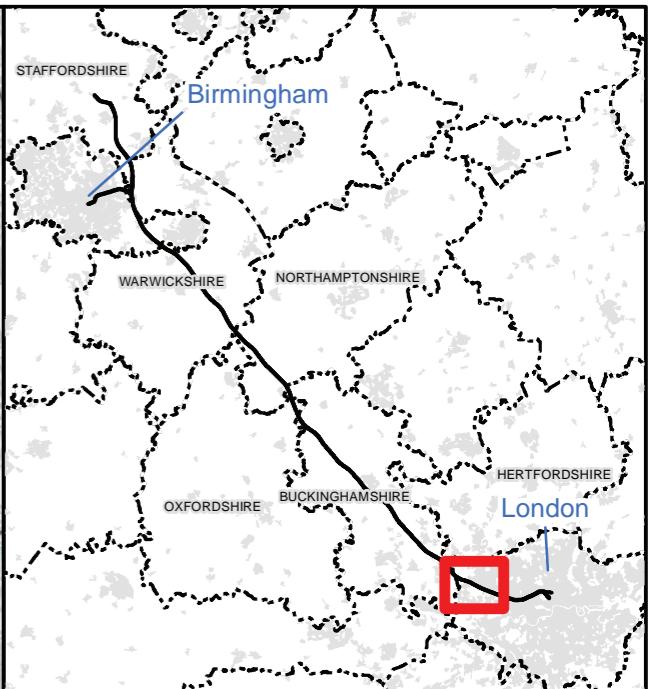
Main Map Legend

- Route in tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Community forum boundary
- Existing railway station
- County boundary
- District/Borough boundary

Map sheets included
in this community forum

Map sheets not included
in this community forum

Map Number	SV-03-INDEX-CFA6
Map Name	Index Map of: Assessment and Monitoring Locations for Construction Sound, Noise & Vibration Assessments
Community Forum Area CFA6: South Ruislip to Ickenham	



Map Series Information:

The SV-03 figure series accompanies the construction noise & vibration assessments. It shows the locations at which a quantitative assessment of the direct effects of construction noise and/or vibration has been carried out. These are labelled as assessment locations with a reference number to enable cross-reference to the construction noise and vibration reports contained in Volume 5: Appendix SV-003 and Volume 5: Appendix SV-002.

The figure series also shows locations at which baseline sound measurements were carried out. These baseline measurement locations are labelled with a reference number to enable cross-reference to the baseline sound reports contained in Volume 5: Appendix SV-002.

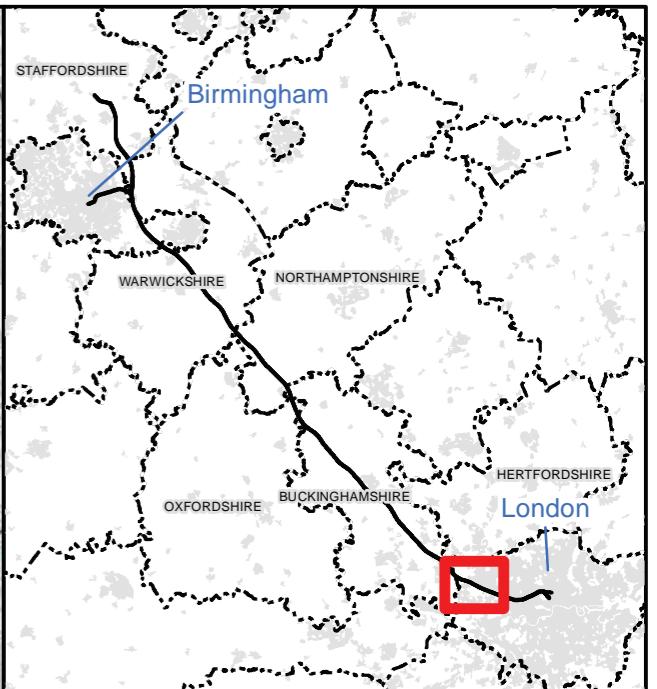
A more detailed explanation of each legend item included on the figures can be found in the data dictionary.

Note: Not all data layers in the legend are represented on every map.



Main Map Legend	
Route in tunnel	Map sheets included
Route on surface	Map sheets not included
Depot, station, headhouse or portal building	in this community forum
Community forum boundary	in this community forum
Existing railway station	
County boundary	
District/Borough boundary	

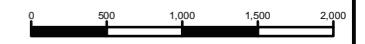
Map Number	SV-04-INDEX-CFA6
Map Name	Index Map of: Assessment and Monitoring Locations for Operational Sound, Noise & Vibration Assessments
Community Forum Area CFA6: South Ruislip to Ickenham	
Scale at A3: 1:50,000	



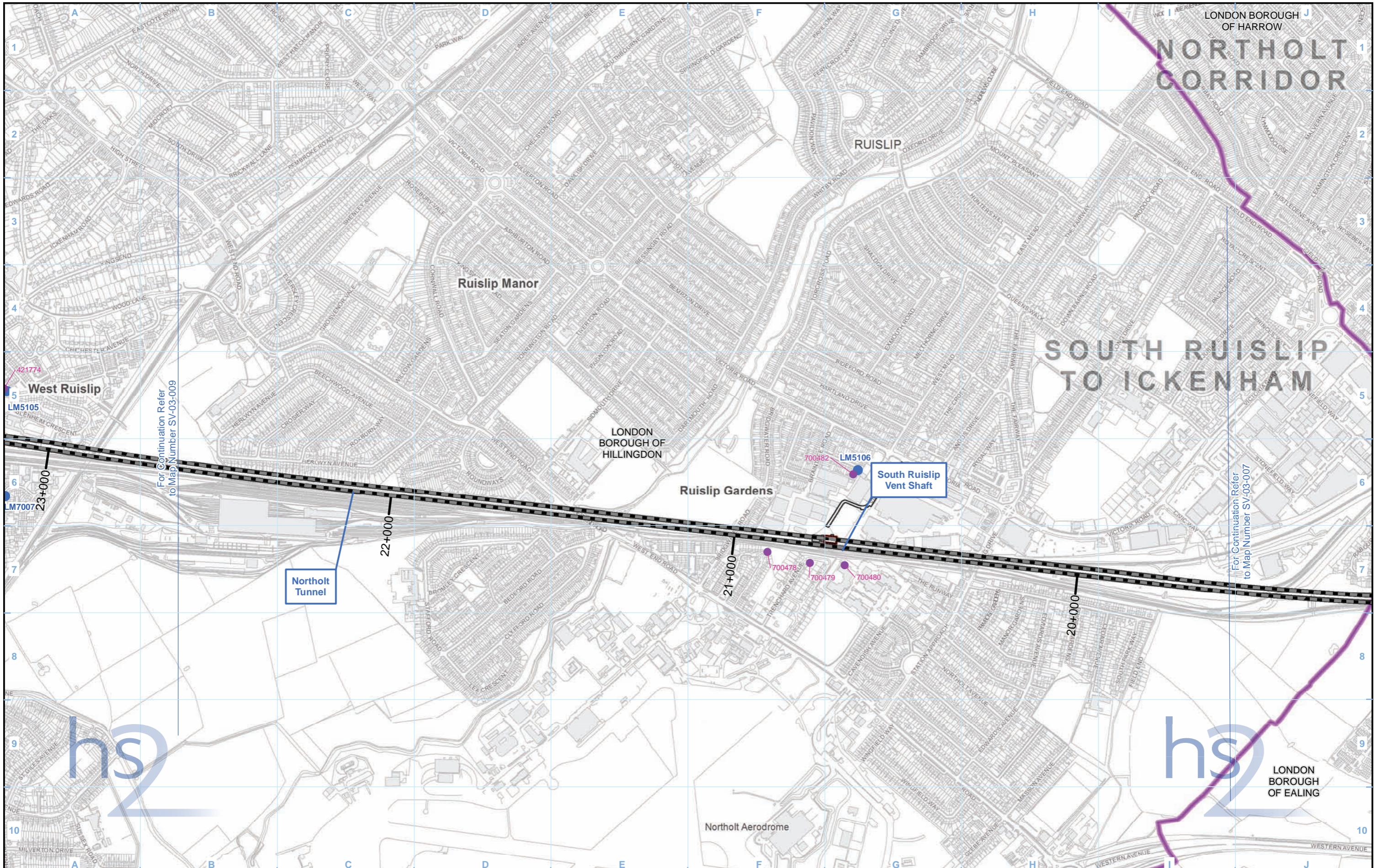
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Metres
Doc Number: C250-ARP-EV-MAP-000-004140--P04.00 Date: 29/10/13



Legend - General features

- Route in bored tunnel
- Route in green tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Community forum boundary
- District/Borough boundary
- County boundary

- | | |
|-------------------------|-----------------------------|
| Engineering earthworks: | Non engineering earthworks: |
| — Embankment | — Embankment |
| — Cutting | — Cutting |

Legend - Sound related features

- Construction airborne sound assessment location
- Construction vibration assessment locations
- Construction airborne sound and vibration assessment location
- Baseline measurement locations

labelled with Assessment Location ID reference number
(for details of the assessment results see relevant Vol 5 Appendix SV-003)

(labelled with Measurement Location reference code)

Map Number **SV-03-008**

Map Name **Assessment and Monitoring Locations for Construction Sound, Noise & Vibration Assessments**

Community Forum Area CFA06:
South Ruislip to Ickenham

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Date: 29/10/13



Legend - General features

- Route in bored tunnel
- Route in green tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Community forum boundary
- District/Borough boundary
- County boundary

- | | |
|-------------------------|-----------------------------|
| Engineering earthworks: | Non engineering earthworks: |
| ■■■■ Embankment | □□□□ Embankment |
| □□□□ Cutting | ■■■■ Cutting |

Legend - Sound related features

- Airborne sound assessment location
- ▲ Airborne sound and vibration assessment location
- ◆ Ground-borne sound and/or vibration assessment location
- ◆ Airborne sound, ground-borne sound and vibration assessment location
- Baseline measurement locations

labelled with Assessment Location ID reference number
(for details of the assessment results see Vol 5 Appendix SV004)

(labelled with Measurement Location reference code)

Map Number

SV-04-008

Map Name

Assessment and Monitoring Locations for Operational Sound, Noise & Vibration Assessments

Community Forum Area CFA06:
South Ruislip to Ickenham

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100 200 300 400

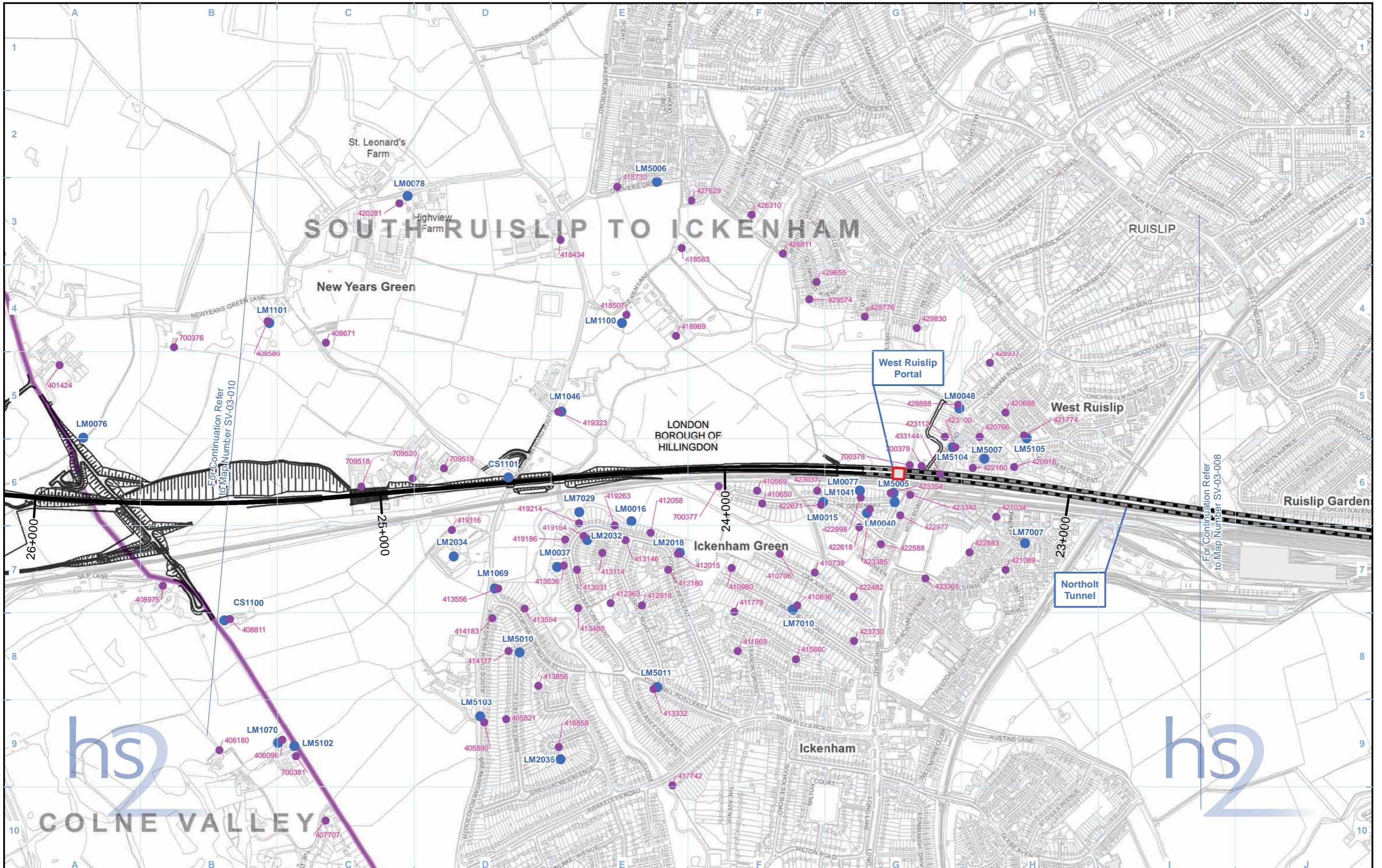
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Scale at A3: 1:10,000

Doc Number: C250-ARP-EV-MAP-000-003862



Date: 29/10/13



Legend - General features

- Route in bored tunnel
- Route in green tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Community forum boundary
- District/Borough boundary
- County boundary

- Engineering earthworks: Non engineering earthworks:
- Embankment
- Cutting
- Embankment
- Cutting

Legend - Sound related features

- Construction airborne sound assessment location
- Construction vibration assessment locations
- Construction airborne sound and vibration assessment location
- Baseline measurement locations

labelled with Assessment Location ID reference number
(for details of the assessment results see relevant Vol 5 Appendix SV-003)

(labelled with Measurement Location reference code)

Map Number

SV-03-009

Map Name

Assessment and Monitoring Locations for Construction Sound, Noise & Vibration Assessments

Community Forum Area CFA06:
South Ruislip to Ickenham



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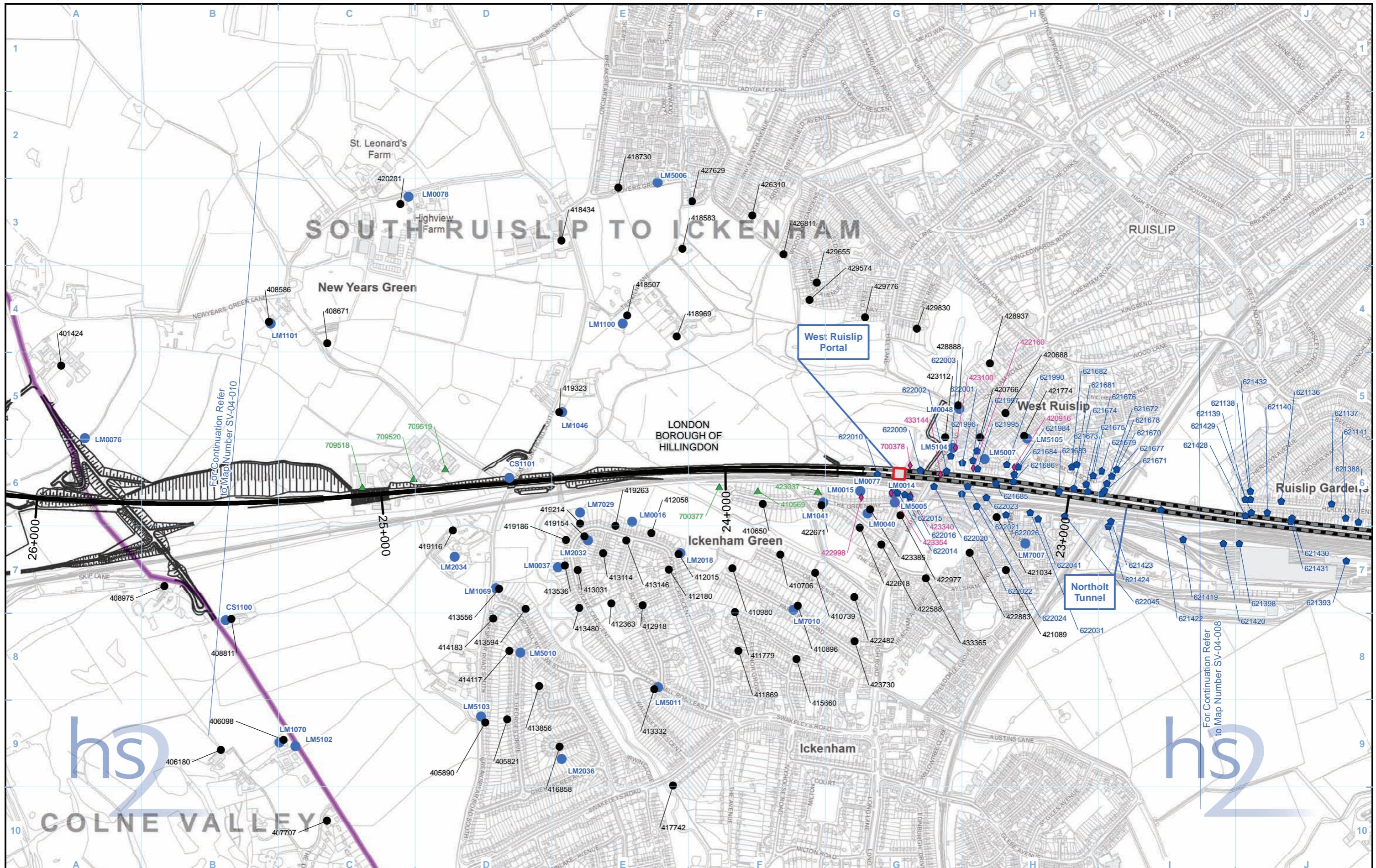
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Doc Number: C250-ARP-EV-MAP-000-003762



Legend - General features

- Route in bored tunnel
 - Route in green tunnel
 - Route on surface
 - Depot, station, headhouse or portal building
 - Community forum boundary
 - District/Borough boundary
 - County boundary

Engineering earthworks: Non engineering earthworks:

-

Legend - Sound related features

- Airborne sound assessment location
 - ▲ Airborne sound and vibration assessment location
 - ◆ Ground-borne sound and/or vibration assessment location
 - ◆ Airborne sound, ground-borne sound and vibration assessment location
 - Baseline measurement locations

{ labelled with Assessment Location ID reference number
(for details of the assessment results see Vol 5 Appendix SV004)

Map Number

SV-04-009

Assessment and Monitoring Locations for Operational Sound, Noise & Vibration Assessments

Community Forum Area CFA06
South Ruislip to Ickenham

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